

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 12,2 h  
 Edition : 18.02.91  
 Replaces : 6.7.90  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 826  
 Injection pump  
 Pump designation : PE6P120A320RS3178  
 EP type number : 0 411 826 752  
 Governor  
 Governor design. : RQV250...1025PA921-2  
 Governor no. : 0 421 813 785

Customer-spec. information  
 Customer : VOLVO

Engine : TD122FS

1st version kW : 287.0  
 Rated speed : 2050

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 457 413 010

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 85...95

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 25.2...25.4  
 100 s: (24.9...25.7)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 4.8...5.1  
 Del.quantity cm<sup>3</sup>/ : 1.8...2.3  
 100 s: (1.5...2.5)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1090  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1200  
 Del.quantity : 252.0...254.0  
 1000 : (249.0...257.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 116...124

Testing:

1st rack travel in: 13.00  
Speed rpm : 1055...1065  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 59...67

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.40  
Speed rpm : 250  
Rack travel in mm : 4.80...5.10

#### CONSTANT REGULATION

Speed rpm : 250...400

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 14.00...14.10

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in mm: 10.30...10.50  
2nd pressure hPa : 120  
Rack travel in mm: 0.20...0.30  
3rd pressure hPa : 810  
Rack travel in mm: 3.10...3.50

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 163.0...165.0  
1000 s: (160.0...168.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1055...1065

#### STARTING FUEL DELIVERY

A02

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 270.0...310.0  
1000 s: (266.0...314.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.80...5.10  
Del. quantity cm<sup>3</sup>/ : 18.0...23.0  
1000 s: (15.5...25.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

Remarks:

:

Delivery valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

Start-of-delivery setting with ROBO  
diaphragm.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,7 h  
Edition : 18.02.91  
Replaces : 5.3.90  
Test oil : ISO-4113

Combination no. : 0 401 846 916

Injection pump  
Pump designation : PE6P120A320RS3248  
EP type number : 0 411 826 792  
Governor  
Governor design. : RQ250/1000PA832-3  
Governor no. : 0 421 801 506

Customer-spec. information  
Customer : DAF

Engine : WS 242

1st version kW : 242.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.20...4.30  
: (4.15...4.35)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.50...12.60

Del. quantity cm<sup>3</sup>/ : 20.9...21.1

100 s: (20.6...21.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 6.5...6.7

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del. quantity : 209.0...211.0

1000 : (206.0...214.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 11.50

Speed rpm : 1035...1050

2nd rack travel in: 4.00

Speed rpm : 1125...1155  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Setting p : w/out bumper spring  
Speed : 250  
Rack tra : 6.0

#### Testing:

Speed rpm : 100  
Minimum rack trave: 7.50  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 335...375

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 13.50...13.60  
2nd speed rpm : 1000  
Rack travel in m: 13.40...13.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 12.50...12.60

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 340  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 250  
Rack travel in m: 11.40...11.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 164.0...166.0  
1000 s: (161.0...169.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1035...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 14.0...20.0  
1000 s: (11.0...23.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,0 x 1  
 Edition : 01.03.91  
 Replaces : 20.12.90  
 Test oil : ISO-4113

Combination no. : 0 401 846 942

Injection pump  
 Pump designation : PE6P110A320LS3851  
 EP type number : 0 411 816 765  
 Governor  
 Governor design. : RQ300/1050PA187-33  
 Governor no. : 0 421 801 574

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441

1st version kW : 151.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 11.8...12.0

100 s: (11.5...12.2)

Spread cm<sup>3</sup> : 0.8

100 s: (1.3)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.5...7.1  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.4)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.1)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 650

Rack travel in mm : 13.10...13.90

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Del.quantity : 118.0...120.0  
 1000 : (115.5...122.5)  
 Spread cm<sup>3</sup> : 8.50  
 1000 : (13.00)

## RATED SPEED

1st version

Setting point:  
 Speed rpm : 650  
 Rack travel in mm : 13.5

Testing:

1st rack travel in: 10.00  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...2.00

LOW IDLE :

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.8

Testing:

Speed rpm : 200  
Minimum rack travel: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.50...7.10  
Rack travel in mm : 2.00  
Speed rpm : 390...430

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm3/ : 117.0...122.0  
1000 s: (114.0...125.0)  
Spread cm3 : 11.00  
1000 s: (14.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.00  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 9,6 x  
Edition : 27.02.91  
Replaces : 15.1.88  
Test oil : ISO-4113

Combination no. : 0 401 848 792

Injection pump  
Pump designation : PE8P120A920/5LS3208  
EP type number : 0 411 828 721  
Governor  
Governor design. : RQ325/1150PA879  
Governor no. : 0 421 801 417

Customer-spec. information  
Customer : KHD

Engine : BF8L513C<sup>n</sup>

1st version kW : 294.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.40...3.50  
: (3.35...3.55)  
Rack travel in mm : 15.00...19.00  
Firing order : 1- 8- 7- 2- 6- 5-  
4- 3

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.30...12.40

Del.quantity cm<sup>3</sup>/ : 18.9...19.1

100 s: (18.6...19.4)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

2nd speed rpm : 325.0  
Rack travel in mm : 6.5...6.7  
Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm<sup>3</sup> : 0.9  
100 s: (1.3)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 700

Rack travel in mm : 14.70...16.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Aneroid pressure h: 900  
Del.quantity : 189.0...191.0  
1000 : (186.0...194.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

## RATED SPEED

1st version

Setting point:  
Speed rpm : 700  
Rack travel in mm : 15.5

Testing:

1st rack travel in: 11.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1260...1290  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.10  
Speed rpm : 325  
Rack travel in mm : 6.50...6.70  
Rack travel in mm : 2.00  
Speed rpm : 400...440

#### CONSTANT REGULATION

Speed rpm : 300...510

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 600  
Rack travel in m: 12.30...12.50

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 400  
Pressure hPa : 900  
Rack travel mm : 12.80...12.90

#### Measurement

Speed 1/min : 400

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 230  
Rack travel in m: 9.80...9.90  
3rd pressure hPa : 350  
Rack travel in m: 10.90...11.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 86.0...88.0  
1000 s: (83.0...91.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 235.0...265.0  
1000 s: (230.0...270.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

#### APPLICATION

Rail car

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 L 3  
 Edition : 18.02.91  
 Replaces : 15.11.90  
 Test oil : ISO-4113  
 Combination no. : 0 401 848 806  
 Injection pump  
 Pump designation : PE8P110A320LS3846-1  
 EP type number : 0 411 818 719  
 Governor  
 Governor design. : RQ300/1050PA187-28  
 Governor no. : 0 421 801 492

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442

1st version kW : 213.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 12.2...12.4

100 s: (11.9...12.6)

Spread cm3 : 0.8

100 s: (1.3)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.9

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.4)

Spread cm3 : 0.6

100 s: (1.1)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 650

Rack travel in mm : 13.10...13.90

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 122.0...124.0

1000 : (119.5...126.5)

Spread cm3 : 8.50

1000 : (13.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 13.5

Testing:

1st rack travel in: 10.20  
Speed rpm : 1080...1090  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...2.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.6

Testing:

Speed rpm : 200  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.30...6.90  
Rack travel in mm : 2.00  
Speed rpm : 390...430

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm3/ : 119.0...125.0  
1000 s: (116.5...127.5)  
Spread cm3 : 11.00  
1000 s: (14.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20  
Speed rpm : 1080...1090

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 11,9 u1  
Edition : 26.02.91  
Replaces : 25.1.91  
Test oil : ISO-4113

Combination no. : 0 402 036 740

Injection pump  
Pump designation : PES6P120A720/3LS3255  
EP type number : 0 412 026 739  
Governor  
Governor design. : RQ300/1000PA813-13  
Governor no. : 0 421 801 529

Customer-spec. information  
Customer : MAN

Engine : D2866LF03

1st version kW : 273.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 14.50...15.50  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10  
& maximum rack tra: 15.0...16.0  
Difference ° CS : 2.00...4.00

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 15.00...15.10

Del.quantity cm3/ : 24.2...24.4

100 s: (23.9...24.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.3

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 550

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1200

Del.quantity : 242.0...244.0

1000 : (239.0...247.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 550  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.80  
Speed rpm : 1045...1060  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.0

Testing:

Speed rpm : 200  
Minimum rack travel: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 700  
Rack travel in m: 15.30...15.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 110  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 470  
Rack travel in m: 13.70...14.10

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm3/ : 236.0...242.0  
1000 s: (233.0...245.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 89.0...99.0  
1000 s: (86.0...102.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 1045...1060

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.90...5.30  
Del.quantity cm3/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 0-7050

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 11,9 u  
 Edition : 26.02.91  
 Replaces : 19.6.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 036 741  
 Injection pump  
 Pump designation : PES6P120A720/3LS3255  
 EP type number : 0 412 026 739  
 Governor  
 Governor design. : RQV300...1000PA876-6  
 Governor no. : 0 421 813 866

## Customer-spec. information

Customer : MAN

Engine : D2866LF03

1st version kW : 273.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.00...4.00

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 15.00...15.10

Del.quantity cm3/ : 24.2...24.4

100 s: (23.9...24.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.7...5.1

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1045

travel mm : 9.90...10.10

2nd speed rpm : 300

travel mm : 1.50...1.70

3rd speed rpm : 500

travel mm : 3.30...3.90

4th speed rpm : 800

travel mm : 6.80...7.20

5th speed rpm : 1300

travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1060

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700  
Aneroid pressure h: 1200  
Del.quantity : 242.0...244.0  
1000 : (239.0...247.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 298...306

### Testing:

1st rack travel in: 13.60  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1125...1155  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 256...264

### Testing:

Speed rpm : 200  
Minimum rack travel: 6.40  
Speed rpm : 300  
Rack travel in mm : 4.80...5.00

## CONSTANT REGULATION

Speed rpm : 290...400

## TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 700  
Rack travel in m: 15.00...15.10  
2nd speed rpm : 1000  
Rack travel in m: 14.60...14.70

## Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 15.00...15.10

## Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.70...11.90

A14

2nd pressure hPa : 110  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 470  
Rack travel in m: 14.00...14.40

## START CUT-OUT

Speed 1/min : 220 (240)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 236.0...242.0  
1000 s: (233.0...245.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 95.0...101.0  
1000 s: (92.0...104.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 134.0...136.0  
1000 s: (131.0...139.0)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 1040...1050

## INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 210.0...230.0  
1000 s: (206.0...234.0)

## LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.70...5.10  
Del.quantity cm<sup>3</sup>/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

## Remarks:

: MAN-NR. 0-7051

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 11,9 u6  
Edition : 27.02.91  
Replaces : 14.12.90  
Test oil : ISO-4113  
  
Combination no. : 0 402 036 744  
  
Injection pump  
Pump designation : PES6P120A720/3LS3255  
EP type number : 0 412 026 739  
Governor  
Governor design. : RQV300...1000PA876-12  
Governor no. : 0 421 813 897

Customer-spec. information  
Customer : MAN

Engine : D2866LF05

1st version kW : 272.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 14.50...15.50  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10  
& maximum rack tra: 14.5...15.5  
Difference ° CS : 2.00...4.00

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 15.10...15.20

Del.quantity cm3/ : 24.4...24.6

100 s: (24.1...24.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.8...5.2

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
travel mm : 9.70...9.90

2nd speed rpm : 300  
travel mm : 0.90...1.30

3rd speed rpm : 550  
travel mm : 3.70...4.30

4th speed rpm : 800  
travel mm : 6.60...7.00

5th speed rpm : 1300  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700  
Aneroid pressure h: 1200  
Del.quantity : 244.0...246.0  
1000 : (241.0...249.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 298...306

Testing:

1st rack travel in: 14.10  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 254...262

Testing:

Speed rpm : 200  
Minimum rack travel: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 280...400

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 15.10...15.20

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 110  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 470  
Rack travel in m: 13.60...14.00

START CUT-OUT

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Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 243.0...247.0  
1000 s: (240.0...250.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 89.0...99.0  
1000 s: (86.0...102.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (-)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 134.0...136.0  
1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.10  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.80...5.20  
Del.quantity cm<sup>3</sup>/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 3-7039

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 a16  
Edition : 18.02.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 036 745  
  
Injection pump  
Pump designation : PES6P110A720/3LS3131  
-3  
EP type number : 0 412 016 734  
Governor  
Governor design. : RQ300/1100PA722-1  
Governor no. : 0 421 801 461

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM447

1st version kW : 168.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
: (4.25...4.45)  
Rack travel in mm : 9.00...12.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1100  

---

Rack travel in mm : 10.90...11.00  

---

Del. quantity cm<sup>3</sup>/ : 13.7...13.9  
100 s: (13.4...14.1)  

---

Spread cm<sup>3</sup> : 0.4  
100 s: (0.8)  

---

2nd speed rpm : 300.0  
Rack travel in mm : 7.2...7.4  
Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
100 s: (1.1...2.3)  
Spread cm<sup>3</sup> : 0.4  
100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 600  
Rack travel in mm : 12.50...13.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Del. quantity : 137.0...139.0  
1000 : (134.5...141.5)  
Spread cm<sup>3</sup> : 4.00  
1000 : (8.00)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 600  
Rack travel in mm : 13.0

Testing:  
1st rack travel in: 9.90

Speed rpm : 1140...1155  
2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.3

#### Testing:

Speed rpm : 100  
Minimum rack trave: 8.80  
Speed rpm : 300  
Rack travel in mm : 7.20...7.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm3/ : 113.0...117.0  
1000 s: (110.0...120.0)  
Spread cm3 : 6.00  
1000 s: (9.00)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1140...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 9,8 a 6  
Edition : 18.02.91  
Replaces : 2.1.90  
Test oil : ISO-4113

Combination no. : 0 402 046 313

Injection pump  
Pump designation : PES6P120A32ORS419  
EP type number : 0 412 026 037  
Governor  
Governor design. : RQV275...1050PA495-8  
Governor no. : 0 421 813 482

Customer-spec. information  
Customer : RVI

Engine : MIDS062045

1st version kW : 169.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.30...10.40

Del.quantity cm3/ : 16.1...16.3

100 s: (15.8...16.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 2.6...3.0

100 s: (2.3...3.3)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 1.00...1.20

2nd speed rpm : 450  
travel mm : 3.30...3.80

3rd speed rpm : 800  
travel mm : 5.70...6.00

4th speed rpm : 1050  
travel mm : 7.60...7.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 700

Del.quantity : 161.0...163.0

1000 : (158.0...166.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 9.30  
Speed rpm : 1125...1135  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 200  
Minimum rack travel: 6.60  
Speed rpm : 275  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION  
Speed rpm : 275...390

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 10.30...10.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.10...8.50  
2nd pressure hPa : 360  
Rack travel in m: 9.80...9.90  
3rd pressure hPa : 160  
Rack travel in m: 8.60...8.90

## START CUT-OUT

Speed 1/min : 195 (215)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 153.0...159.0  
1000 s: (150.0...162.0)  
Aneroid pressure h: -

A21

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 109.0...111.0  
1000 s: (106.0...114.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.30  
Speed rpm : 1125...1135

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...180.0  
1000 s: (156.0...184.0)

## LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 26.0...30.0  
1000 s: (23.0...33.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:

Start-of-delivery mark 9.5° cam angle  
after start of delivery cyl. 1

## APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 9,8 k 1  
 Edition : 01.02.91  
 Replaces : 14.12.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 342  
 Injection pump  
 Pump designation : PES6P120A320RS525-1  
 EP type number : 0 412 026 059  
 Governor  
 Governor design. : RGV275...1100PA984  
 Governor no. : 0 421 813 904

Customer spec. information  
 Customer : RVI

Engine : MIDR 06 20 45

1st version kW : 202.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.60...10.70

Del.quantity cm<sup>3</sup>/ : 16.7...16.9

100 s: (16.4...17.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0  
 Rack travel in mm : 5.3...5.7  
 Del.quantity cm<sup>3</sup>/ : 1.5...2.1  
 100 s: (1.2...2.4)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1145  
 travel mm : 8.40...8.60  
 2nd speed rpm : 275  
 travel mm : 0.80...1.20  
 3rd speed rpm : 500  
 travel mm : 3.50...4.10  
 4th speed rpm : 850  
 travel mm : 5.90...6.30  
 5th speed rpm : 1450  
 travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1125  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 700

Del.quantity : 167.0...169.0  
1000 : (164.0...172.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 298...306

#### Testing:

1st rack travel in: 9.60  
Speed rpm : 1170...1180  
2nd rack travel in: 4.00  
Speed rpm : 1245...1275  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control Lever  
position degrees: 242...250

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.20  
Speed rpm : 275  
Rack travel in mm : 5.40...5.60

#### CONSTANT REGULATION

Speed rpm : 320...440

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 10.60...10.70

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.10...9.30  
2nd pressure hPa : 220  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 195  
Rack travel in m: 9.40...9.70

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

A23

Speed rpm : 700  
Del.quantity cm3/ : 156.0...162.0  
1000 s: (153.0...165.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 102.0...104.0  
1000 s: (99.0...107.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.60  
Speed rpm : 1170...1180

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...150.0  
1000 s: (120.0...150.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.30...5.70  
Del.quantity cm3/ : 15.0...21.0  
1000 s: (12.0...24.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 7,7 b  
 Edition : 01.03.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 343  
 Injection pump  
 Pump designation : PES6P120A720RS3275  
 EP type number : 0 412 026 745  
 Governor  
 Governor design. : RQV300...1100PA954-1  
 K  
 Governor no. : 0 421 815 273  
 Customer-spec. information  
 Customer : IVECO-FIAT  
 Engine : 8360.46.016

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test Lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.10...13.20

Del.quantity cm3/ : 21.8...22.0

100 s: (21.5...22.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.0...5.4  
 Del.quantity cm3/ : 2.0...2.6  
 100 s: (1.7...2.9)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1160  
 travel mm : 10.60...10.80  
 2nd speed rpm : 300  
 travel mm : 1.00...1.40  
 3rd speed rpm : 850  
 travel mm : 6.60...7.00  
 4th speed rpm : 1350  
 travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1150  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1500  
 Del.quantity : 218.0...220.0  
 1000 : (215.0...223.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 275  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 340...450

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.10...13.20  
2nd speed rpm : 1100  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 750  
Rack travel in m: 12.40...12.60  
4th speed rpm : 400  
Rack travel in m: 10.20...10.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1500  
Rack travel mm : 13.10...13.20

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.70...8.90  
2nd pressure hPa : 600  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 420  
Rack travel in m: 9.70...10.00

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 202.0...206.0  
1000 s: (199.0...209.0)  
Aneroid pressure h: 1500  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 202.0...208.0  
1000 s: (199.0...211.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 102.0...104.0  
1000 s: (99.0...107.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 11.70  
Speed rpm : 1140...1150

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 85.0...115.0  
1000 s: (81.0...119.0)

## LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.00...5.40  
Del.quantity cm<sup>3</sup>/ : 20.0...26.0  
1000 s: (17.0...29.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 12,0 f1  
 Edition : 27.02.91  
 Replaces : 5.11.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 758  
 Injection pump  
 Pump designation : PES6P120A320RS3139  
 EP type number : 0 412 026 718  
 Governor  
 Governor design. : RQV275...950PA728-1  
 Governor no. : 0 421 813 465

## Customer-spec. information

Customer : RVI  
 Engine : MIDR 063540

1st version kW : 243.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 19.7...19.9

100 s: (19.4...20.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.20...5.60

Del.quantity cm3/ : 2.2...2.6

100 s: (1.9...2.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
 travel mm : 1.30...1.70

2nd speed rpm : 450  
 travel mm : 3.30...3.70

3rd speed rpm : 800  
 travel mm : 5.60...6.00

4th speed rpm : 950  
 travel mm : 6.70...6.90

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 197.0...199.0

1000 : (194.0...202.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 59...67

### Testing:

1st rack travel in: 11.50  
Speed rpm : 1020...1030  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 8...16

### Testing:

Speed rpm : 200  
Minimum rack travel: 7.10  
Speed rpm : 275  
Rack travel in mm : 5.30...5.50

## CONSTANT REGULATION

Speed rpm : 300...400

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.50...12.60

## Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.80...9.20  
2nd pressure hPa : 520  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 200  
Rack travel in m: 10.10...10.40

## START CUT-OUT

Speed 1/min : 195 (215)

## FUEL DELIVERY CHARACTERISTICS

## 1st version

Aneroid pressure h: 1000  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 198.0...204.0  
1000 s: (195.0...207.0)

Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 112.0...114.0  
1000 s: (109.0...117.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1020...1030

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 155.0...185.0  
1000 s: (151.0...189.0)

## LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.20...5.60  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000 s: (19.0...29.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 9,8 e  
Edition : 18.02.91  
Replaces : 4.5.90  
Test oil : ISO-4113

Combination no. : 0 402 046 784

Injection pump  
Pump designation : PES6P120A320RS3139  
EP type number : 0 412 026 718  
Governor  
Governor design. : RQV275...1000PA728-2  
Governor no. : 0 421 813 599

Customer-spec. information  
Customer : RVI

Engine : MIDR 062045 E

1st version kW : 236.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 16.0...16.2

100 s: (15.7...16.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.2...5.6

Del.quantity cm3/ : 3.2...3.6

100 s: (2.9...3.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 0.90...1.10

2nd speed rpm : 450  
travel mm : 3.30...3.70

3rd speed rpm : 800  
travel mm : 5.60...6.00

4th speed rpm : 1000  
travel mm : 7.00...7.20

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1170

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 160.0...162.0

1000 : (157.0...165.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 59...67

### Testing:

1st rack travel in: 10.20  
Speed rpm : 1065...1075  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 8...16

### Testing:

Speed rpm : 20  
Minimum rack travel: 7.20  
Speed rpm : 275  
Rack travel in mm : 5.30...5.50

## CONSTANT REGULATION

Speed rpm : 230...320

Aneroid/Altitude  
Compensator Test

### 1st version

#### Setting

Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.20...11.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 8.10...8.50

2nd pressure hPa : 320

Rack travel in m: 10.50...10.60

3rd pressure hPa : 160

Rack travel in m: 9.10...9.30

## START CUT-OUT

Speed 1/min : 195 (215)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1000

Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 182.5...188.5  
1000 s: (179.5...191.5)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 111.0...113.0  
1000 s: (108.0...116.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 10.20

Speed rpm : 1065...1075

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 155.0...185.0  
1000 s: (151.0...189.0)

## LOW IDLE

Speed rpm : 275

Rack travel in mm : 5.20...5.60

Del.quantity cm<sup>3</sup>/ : 32.0...36.0  
1000 s: (29.0...39.0)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 12,0 f2  
 Edition : 18.02.91  
 Replaces : 22.11.90  
 Test oil : ISO-4113

Combination no. : 0 402 046 791

Injection pump  
 Pump designation : PES6P120A320RS3139  
 EP type number : 0 412 026 718  
 Governor  
 Governor design. : RQV275...950PA728-4  
 Governor no. : 0 421 813 678

## Customer-spec. information

Customer : RVI

Engine : MIDR 063540 H

1st version kW : 264.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.30...13.40

Del.quantity cm3/ : 21.2...21.4  
 100 s: (20.9...21.7)

Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 275.0  
 Rack travel in mm : 5.6...6.0  
 Del.quantity cm3/ : 2.4...2.8  
 100 s: (2.1...3.1)

Spread cm3 : 0.8  
 100 s: (1.2)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
 travel mm : 1.30...1.70

2nd speed rpm : 450  
 travel mm : 3.30...3.70

3rd speed rpm : 800  
 travel mm : 5.60...6.00

4th speed rpm : 950  
 travel mm : 6.70...6.90

5th speed rpm : 1500  
 travel mm : 11.00...12.00

### GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1000

Del.quantity : 212.0...214.0  
 1000 : (209.0...217.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

#### Testing:

1st rack travel in: 12.30  
Speed rpm : 1015...1025  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 9...17

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 275  
Rack travel in mm : 5.70...5.90

#### CONSTANT REGULATION

Speed rpm : 295...400

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.30...13.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.30  
2nd pressure hPa : 660  
Rack travel in m: 12.60...12.70  
3rd pressure hPa : 200  
Rack travel in m: 10.20...10.40

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 950

Del.quantity cm<sup>3</sup>/ : 210.0...216.0  
1000 s: (207.0...219.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 112.0...114.0  
1000 s: (109.0...117.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 1015...1025

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...180.0  
1000 s: (146.0...184.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.60...6.00  
Del.quantity cm<sup>3</sup>/ : 24.0...28.0  
1000 s: (21.0...31.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 9,5 h  
Edition : 01.03.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 046 821  
  
Injection pump  
Pump designation : PES6P120A72ORS3273  
EP type number : 0 412 026 746  
Governor  
Governor design. : RQV450...1100PA989  
Governor no. : 0 421 813 918

Customer-spec. information  
Customer : IVECO-UNIC

Engine : 8465.21.004

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 9.30...9.40

Del.quantity cm<sup>3</sup>/ : 15.5...15.7  
100 s: (15.2...16.0)

Spread cm<sup>3</sup> : 0.5  
100 s: (0.9)

2nd speed rpm : 450.0  
Rack travel in mm : 3.9...4.3  
Del.quantity cm<sup>3</sup>/ : 2.0...2.6  
100 s: (1.7...2.9)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1145  
travel mm : 7.90...8.10  
2nd speed rpm : 450  
travel mm : 0.70...1.10  
3rd speed rpm : 650  
travel mm : 3.90...4.50  
4th speed rpm : 950  
travel mm : 6.60...7.00  
5th speed rpm : 1500  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1180  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Del.quantity : 155.0...157.0  
1000 : (152.0...160.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 8.30  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1265...1295  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 64...72

Testing:  
Speed rpm : 100  
Minimum rack trave: 5.60  
Speed rpm : 450  
Rack travel in mm : 4.00...4.20

CONSTANT REGULATION  
Speed rpm : 450...580

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.30  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...170.0  
1000 s: (136.0...174.0)

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 10,1 g2  
 Edition : 18.02.91  
 Replaces : 7.1.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 739  
 Injection pump  
 Pump designation : PES6P110A72ORS3217  
 EP type number : 0 412 016 724  
 Governor  
 Governor design. : RSV400...1050P2A549  
 Governor no. : 0 421 833 350

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6101 HPWD1

1st version kW : 230.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 683 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness : 6.00X3.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 3.35...3.45  
 : (3.30...3.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 20.5...20.7

100 s: (20.3...20.9)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.7...5.9

Del.quantity cm3/ : 2.0...2.4  
 100 s: (1.7...2.6)

Spread cm3 : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1200

Del.quantity : 205.5...207.5

1000 : (203.5...209.5)

Spread cm3 : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 38...46

Testing:

1st rack travel in: 11.80  
Speed rpm : 1095...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1175  
3rd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 15...23  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.3

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.70...5.90

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 700  
Rack travel in m: 13.70...13.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.70...13.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 385  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 640  
Rack travel in m: 12.80...13.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 212.5...216.5  
1000 s: (210.5...218.5)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 156.0...160.0  
1000 s: (154.0...162.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1095...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...180.0  
1000 s: (155.0...185.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 20.0...24.0  
1000 s: (17.5...26.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE47354

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark or blockage =  
8.5° cam rotation angle after start of  
delivery for cylinder 1.

#### APPLICATION

Tractor (tractor engines)



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 21,9 v 3  
Edition : 25.01.91  
Replaces : 17.10.90  
Test oil : ISO-4113

Combination no. : 0 402 640 807A

Injection pump  
Pump designation : PE12P120A320LS7806  
EP type number : 0 412 620 805  
Governor  
Governor design. : RQV400...1065PA835-2  
Governor no. : 0 421 813 603

Customer spec. information  
Customer : MERCEDES-BENZ

Engine : OM 444 A

1st version kW : 380.0  
Rated speed : 2130

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 150...170

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
                  : (3.95...4.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 12- 1- 5- 9- 8- 3-  
                  4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
                  180-225-240-285-300-  
                  345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.70...13.90

Del.quantity cm3/ : 19.7...20.0

100 s: (19.4...20.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 400.0  
Rack travel in mm : 5.4...5.6  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)

Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.00...1.20  
2nd speed rpm : 500  
travel mm : 3.10...3.30  
3rd speed rpm : 1100  
travel mm : 7.30...7.70  
4th speed rpm : 1225  
travel mm : 8.30...8.70

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1180  
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 700  
Del.quantity : 197.0...200.0  
1000 : (194.0...203.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1105...1115  
2nd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 62...70

Testing:  
Speed rpm : 100  
Minimum rack trave: 6.10  
Speed rpm : 400  
Rack travel in mm : 4.40...4.60

CONSTANT REGULATION  
Speed rpm : 400...600

TORQUE CONTROL  
Dimension a mm : 0.60  
Torque control curve - 1st version  
1st speed rpm : 1065  
Rack travel in m: 12.70...12.90  
2nd speed rpm : 975  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 900  
Rack travel in m: 13.90...14.10  
4th speed rpm : 800  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 13.70...13.90

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 500  
Rack travel in m: 12.60...12.80  
3rd pressure hPa : 950  
Rack travel in m: 15.10...15.20  
4th pressure hPa : 1100  
Rack travel in m: 14.20...14.40  
5th pressure hPa : -  
Rack travel in m: 10.90...11.10

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 1065  
Del.quantity cm<sup>3</sup>/ : 184.0...188.0  
1000 s: (181.0...191.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1100  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 212.0...216.0  
1000 s: (209.0...219.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1100  
Speed rpm : 1065  
Del.quantity cm<sup>3</sup>/ : 174.0...177.0  
1000 s: (171.0...180.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 125.0...127.0  
1000 s: (122.0...130.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1105...1115

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...210.0  
1000 s: (186.0...214.0)

Remarks:

:

APPLICATION

Rail car

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 22,0 e 2  
Edition : 18.01.91  
Replaces : 17.10.90  
Test oil : ISO-4113

Combination no. : 0 402 640 822

Injection pump  
Pump designation : PE12P120A320LS7814-2  
EP type number : 0 412 620 824  
Governor  
Governor design. : RQ900PA966-1  
Governor no. : 0 421 801 550

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 539.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 150...170

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
: (4.75...4.95)  
Rack travel in mm : 19.00...21.00  
Firing order : 12- 1- 5- 9- 8- 3-  
4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
180-225-240-285-300-  
345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 14.50...14.60

Del.quantity cm3/ : 29.4...29.6

100 s: (29.1...29.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 5.4...5.7  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 935  
travel mm : 4.60...5.10  
2nd speed rpm : 1070  
travel mm : 13.70...14.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 850  
Del.quantity : 294.0...296.0  
1000 : (291.0...299.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version

Testing:

1st rack travel in: 13.50

Speed rpm : 905...910

2nd rack travel in: 4.00

Speed rpm : 940...950

4th rack travel in: 1000

Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50

Speed rpm : 905...910

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 270.0...290.0

1000 s: (266.0...294.0)

Remarks:

:

Observe VDT-I-420/120

APPLICATION

Generator

Note remarks

1st version  
Speed rpm : 1050  
Aneroid pressure h: 1100  
Del.quantity : 211.0...213.0  
1000 : (208.0...216.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1090...1110  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Control lever  
position degrees: 64...72

Testing:  
Speed rpm : 250  
Minimum rack travel: 7.00  
Speed rpm : 350  
Rack travel in mm : 5.40...6.00

CONSTANT REGULATION  
Speed rpm : 400...600

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.00...11.30

Measurement  
Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 500  
Rack travel in m: 13.00...13.30

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 600  
Del.quantity cm3/ : 210.0...213.0  
1000 s: (207.0...216.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 141.0...143.0  
1000 s: (138.0...146.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1090...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...230.0  
1000 s: (206.0...234.0)

#### TESTING & SETTING RACK TRAVEL SENSOR

Supply voltage : 24.0

Remarks:  
:

#### APPLICATION

Rail car

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 21,9 j 2  
Edition : 18.02.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 640 825  
  
Injection pump  
Pump designation : PE12P120A320LS7813-2  
EP type number : 0 412 620 826  
Governor  
Governor design. : RQ900PA966-2  
Governor no. : 0 421 801 571

Customer spec. information  
Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 529.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 150...170

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 19.00...21.00  
Firing order : 12- 1- 5- 9- 8- 3-  
4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
180-225-240-285-300-  
345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 14.50...14.60

Del.quantity cm3/ : 28.0...28.2

100 s: (27.7...28.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 5.4...5.7  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 880  
travel mm : 1.40...1.80  
2nd speed rpm : 940  
travel mm : 5.50...5.90  
3rd speed rpm : 1000  
travel mm : 11.10...11.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 850  
Del.quantity : 280.0...282.0  
1000 : (277.0...285.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 86...94

Testing:  
1st rack travel in: 13.50  
Speed rpm : 905...910  
2nd rack travel in: 4.00  
Speed rpm : 940...950  
4th rack travel in: 1000  
Speed rpm : 0.00...1.00

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 905...910

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...290.0  
1000 s: (266.0...294.0)

Remarks:

:

Observe VDT-I-420/120

#### APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 21,9 j 3  
 Edition : 18.02.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 826  
 Injection pump  
 Pump designation : PE12P120A320LS7813-2  
 EP type number : 0 412 620 826  
 Governor  
 Governor design. : RQ750PA966-3  
 Governor no. : 0 421 801 572

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 441.0  
 Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 15.10...15.20

Del.quantity cm<sup>3</sup>/ : 28.0...28.2

100 s: (27.7...28.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.4...5.7  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 740  
 travel mm : 3.00...3.40  
 2nd speed rpm : 780  
 travel mm : 6.40...6.80  
 3rd speed rpm : 820  
 travel mm : 10.70...11.10

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del.quantity : 280.0...282.0  
 1000 : (277.0...285.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 86...94

Testing:  
1st rack travel in: 14.10  
Speed rpm : 755...760  
2nd rack travel in: 4.00  
Speed rpm : 780...790  
4th rack travel in: 1000  
Speed rpm : 0.00...1.00

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.10  
Speed rpm : 755...760

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 270.0...290.0  
1000 s: (266.0...294.0)

Remarks:

:

Observe VDT-I-420/120

#### APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,7 j  
 Edition : 18.02.91  
 Replaces : 7.1.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 893  
 Injection pump  
 Pump designation : PE6P120A320RS7202  
 EP type number : 0 412 626 835  
 Governor  
 Governor design. : RQ250/1000PA936  
 Governor no. : 0 421 801 507

Customer-spec. information  
 Customer : DAF

Engine : WS 268

1st version kW : 268.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.90...12.00

Del.quantity cm<sup>3</sup>/ : 20.8...21.0

100 s: (20.5...21.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 4.9...5.3  
 Del.quantity cm<sup>3</sup>/ : 2.1...2.7  
 100 s: (1.8...3.0)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1000  
 Del.quantity : 208.5...210.5  
 1000 : (205.5...213.5)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version

Setting point:  
 Speed rpm : 550  
 Rack travel in mm : 15.8

Testing:  
 1st rack travel in: 10.90

Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.60  
Speed rpm : 250  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 2.00  
Speed rpm : 310...350

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 1000  
Rack travel in m: 12.80...13.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.90...12.00

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 360  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 220  
Rack travel in m: 10.10...10.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 145.5...147.5  
1000 s: (142.5...150.5)

#### BREAKAWAY

#### 1st version

B20

1mm rack travel less than

full load rack tr: 10.90  
Speed rpm : 1035...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.30  
Del.quantity cm3/ : 21.0...27.0  
1000 s: (18.0...30.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,7 k6  
 Edition : 18.02.91  
 Replaces : 3.8.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 894  
 Injection pump  
 Pump designation : PE6P120A320RS7194  
 EP type number : 0 412 626 834  
 Governor  
 Governor design. : RQ250/1000PA936  
 Governor no. : 0 421 801 507

Customer-spec. information  
 Customer : DAF

Engine : WS 295

1st version kW : 295.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 23.9...24.1

100 s: (23.6...24.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 7.6...8.0  
 Del.quantity cm<sup>3</sup>/ : 2.2...2.8  
 100 s: (1.9...3.1)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1000  
 Del.quantity : 239.0...241.0  
 1000 : (236.0...244.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 12.70

Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.7

#### Testing:

Speed rpm : 100  
Minimum rack trave: 8.20  
Speed rpm : 250  
Rack travel in mm : 6.60...6.80  
Rack travel in mm : 2.00  
Speed rpm : 345...385

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 14.70...14.80  
2nd speed rpm : 1000  
Rack travel in m: 14.60...14.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.70...13.80

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 460  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 310  
Rack travel in m: 12.00...12.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 165.0...167.0  
1000 s: (162.0...170.0)

#### BREAKAWAY

#### 1st version

B22

1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1035...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.60...6.80

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,0 t 4  
 Edition : 25.01.91  
 Replaces : 5.10.90  
 Test oil : ISO-4113

Combination no. : 0 402 646 897

Injection pump  
 Pump designation : PE6P120A320LS7808  
 EP type number : 0 412 626 816  
 Governor  
 Governor design. : RQ300/950PA762-10  
 Governor no. : 0 421 801 511

Customer spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 249.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del. quantity cm<sup>3</sup>/ : 21.4...21.6  
 100 s: (21.1...21.9)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.7...6.0  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2

Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 900  
 Del. quantity : 214.0...216.0  
 1000 : (211.0...219.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version

Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0



Testing:

1st rack travel in: 13.80  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.8

Testing:

Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.90...14.10

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 550  
Rack travel in m: 12.70...12.90  
3rd pressure hPa : 1100  
Rack travel in m: 14.10...14.20  
4th pressure hPa : 1200  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 9.50...9.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1350  
Speed rpm : 950  
Del.quantity cm3/ : 241.0...243.0  
1000 s: (238.0...246.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

Aneroid pressure h: 1350  
Speed rpm : 800  
Del.quantity cm3/ : 241.0...246.0  
1000 s: (238.0...249.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 205.0...225.0  
1000 s: (201.0...229.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,0 t 5  
 Edition : 25.01.91  
 Replaces : 5.10.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 901  
 Injection pump  
 Pump designation : PE6P120A320LS7808  
 EP type number : 0 412 626 816  
 Governor  
 Governor design. : RQV300...950PA797-12  
 Governor no. : 0 421 813 840

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 249.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm<sup>3</sup>/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.40

2nd speed rpm : 620  
 travel mm : 5.00...5.40

3rd speed rpm : 780  
 travel mm : 6.00...6.50

4th speed rpm : 1010  
 travel mm : 8.30...8.80

5th speed rpm : 1100  
 travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1040

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 214.0...216.0  
1000 : (211.0...219.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:

1st rack travel in: 13.80  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 80...88

Testing:

Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00

CONSTANT REGULATION

Speed rpm : 300...500

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.90...14.10

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 550  
Rack travel in m: 13.10...13.30  
3rd pressure hPa : 1100  
Rack travel in m: 14.10...14.20  
4th pressure hPa : 1200  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 9.50...9.80

START CUT-OUT

B26

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1350  
Speed rpm : 950  
Del.quantity cm3/ : 241.0...243.0  
1000 s: (238.0...246.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1350  
Speed rpm : 800  
Del.quantity cm3/ : 241.0...246.0  
1000 s: (238.0...249.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 205.0...225.0  
1000 s: (201.0...229.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 13,8 w  
Edition : 27.02.91  
Replaces : 30.11.90  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 902  
  
Injection pump  
Pump designation : PE6P130A720RS7197  
EP type number : 0 412 636 815  
Governor  
Governor design. : RQV300...900PA946  
Governor no. : 0 421 813 845

Customer-spec. information  
Customer : IVECO-UNIC

Engine : 8210.42.151

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.50...13.60

Del.quantity cm3/ : 25.5...25.8

100 s: (25.1...26.1)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 300.0

Rack travel in mm : 5.1...5.5

Del.quantity cm3/ : 1.9...2.5

100 s: (1.5...2.9)

Spread cm3 : 1.0

100 s: (1.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.00...1.40

2nd speed rpm : 450  
travel mm : 2.80...3.40

3rd speed rpm : 700  
travel mm : 5.50...5.90

4th speed rpm : 900  
travel mm : 7.70...7.90

5th speed rpm : 1200  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 970

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 900

Aneroid pressure h: 900

Del.quantity : 255.0...258.0

1000 : (251.5...261.5)

Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 120...128

Testing:  
1st rack travel in: 12.50  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1020...1050  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 78...86

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.80  
Speed rpm : 300  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION  
Speed rpm : 320...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.50...13.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 340  
Rack travel in m: 12.90...13.00  
3rd pressure hPa : 280  
Rack travel in m: 11.50...11.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 269.0...276.0  
1000 s: (265.5...279.5)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 197.0...200.0  
1000 s: (193.5...203.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 940...950

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...280.0  
1000 s: (236.0...284.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.10...5.50  
Del.quantity cm<sup>3</sup>/ : 19.0...25.0  
1000 s: (15.0...29.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)

#### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,0 t 7  
 Edition : 25.01.91  
 Replaces : 15.11.90  
 Test oil : ISO-4113

Combination no. : 0 402 646 908

Injection pump  
 Pump designation : PE6P120A320LS7808  
 EP type number : 0 412 626 816  
 Governor  
 Governor design. : RQ300/950PA932-3  
 Governor no. : 0 421 801 528

Customer spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 249.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del. quantity cm<sup>3</sup>/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del. quantity : 214.0...216.0

1000 : (211.0...219.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.80  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.8

Testing:

Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.90...14.10

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 550  
Rack travel in m: 13.30...13.50  
3rd pressure hPa : 1100  
Rack travel in m: 14.10...14.20  
4th pressure hPa : 1200  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 9.40...9.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1350  
Speed rpm : 950  
Del.quantity cm3/ : 241.0...243.0  
1000 s: (238.0...246.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1350  
Speed rpm : 800  
Del.quantity cm3/ : 241.0...246.0  
1000 s: (238.0...249.0)

Spread cm3 : 8.00  
1000 s: (12.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 13.00...13.50

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,7 L  
Edition : 18.02.91  
Replaces : 14.12.90  
Test oil : ISO-4113

Combination no. : 0 402 646 912

Injection pump  
Pump designation : PE6P120A320RS7218  
EP type number : 0 412 626 839  
Governor  
Governor design. : RQ250/1000PA936-1  
Governor no. : 0 421 801 508

Customer spec. information  
Customer : DAF

Engine : WS 268

1st version kW : 268.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
: (5.25...5.45)  
Rack travel in mm : 14.50...15.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 14.5...15.5  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 15.00...15.10

Del. quantity cm<sup>3</sup>/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0  
Rack travel in mm : 6.6...7.0  
Del. quantity cm<sup>3</sup>/ : 2.8...3.4  
100 s: (2.5...3.7)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.80...17.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 850  
Aneroid pressure h: 1000  
Del. quantity : 234.0...236.0  
1000 : (231.0...239.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

1st version



Setting point:

Speed rpm : 550  
Rack travel in mm : 16.4

Testing:

1st rack travel in: 14.00  
Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...2.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 310...350

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 15.30...15.40  
2nd speed rpm : 1000  
Rack travel in m: 15.20...15.40

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 480  
Rack travel in m: 14.20...14.30  
3rd pressure hPa : 330  
Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 96.0...106.0  
1000 s: (92.0...110.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 164.0...166.0  
1000 s: (161.0...169.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.00  
Speed rpm : 1035...1050

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,7 L1  
 Edition : 18.02.91  
 Replaces : 14.12.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 913  
 Injection pump  
 Pump designation : PE6P120A320RS7218  
 EP type number : 0 412 626 839  
 Governor  
 Governor design. : RQV250...1000PA939  
 Governor no. : 0 421 813 829

Customer-spec. information  
 Customer : DAF

Engine : WS 268

1st version kW : 268.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
 : (5.25...5.45)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 15.00...15.10

Del.quantity cm3/ : 23.5...23.7

100 s: (23.2...24.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 6.6...7.0  
 Del.quantity cm3/ : 3.1...3.7  
 100 s: (2.8...4.0)

Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
 travel mm : 7.80...8.00

2nd speed rpm : 250  
 travel mm : 0.70...1.10

3rd speed rpm : 400  
 travel mm : 2.50...3.10

4th speed rpm : 700  
 travel mm : 4.50...4.90

5th speed rpm : 1350  
 travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1125  
 Rack travel in mm : 15.20...17.80

# FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 850  
Aneroid pressure h: 1000  
Del.quantity : 235.0...237.0  
1000 : (232.0...240.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 118...126

### Testing:

1st rack travel in: 14.00  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

### LOW IDLE 1

Control lever  
position degrees: 78...86

### Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10

## CONSTANT REGULATION

Speed rpm : 270...380

Aneroid/Altitude  
Compensator Test

## 1st version

### Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 15.00...15.10

### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 480  
Rack travel in m: 14.20...14.30  
3rd pressure hPa : 330  
Rack travel in m: 13.20...13.40

## FUEL DELIVERY CHARACTERISTICS

## 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 99.0...109.0  
1000 s: (95.0...113.0)  
Spread cm3 : 10.00  
1000 s: (14.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 165.0...167.0  
1000 s: (162.0...170.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 14.00

Speed rpm : 1040...1050

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

## Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 13,8 g  
Edition : 18.02.91  
Replaces : 5.11.90  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 914  
  
Injection pump  
Pump designation : PE6P130A720RS7197  
EP type number : 0 412 636 815  
Governor  
Governor design. : RQ300/900PA968  
Governor no. : 0 421 801 540

Customer-spec. information  
Customer : IVECO-UNIC

Engine : 8210.42.153

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 1 688 901 105  
  
Opening  
pressure, bar : 207...210  
  
Orifice plate  
diameter mm : 0,8  
  
Test lines : 1 680 750 015  
  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.50...13.60

Del.quantity cm3/ : 25.5...25.8

100 s: (25.1...26.1)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 300.0

Rack travel in mm : 5.2...5.6

Del.quantity cm3/ : 1.9...2.5

100 s: (1.5...2.9)

Spread cm3 : 1.0

100 s: (1.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 900

Aneroid pressure h: 900

Del.quantity : 255.0...258.0

1000 : (251.5...261.5)

Spread cm3 : 6.00

1000 : (10.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.50

Speed rpm : 945...960

2nd rack travel in: 4.00

Speed rpm : 1070...1100

4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.90  
Speed rpm : 300  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in mm : 13.50...13.60  
2nd speed rpm : 600  
Rack travel in mm : 13.50...13.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.50...13.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in mm : 10.70...10.90  
2nd pressure hPa : 345  
Rack travel in mm : 12.70...12.80  
3rd pressure hPa : 275  
Rack travel in mm : 11.10...11.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 269.0...276.0  
1000 s: (269.0...276.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 181.0...184.0  
1000 s: (177.5...187.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack travel: 12.50  
Speed rpm : 945...960

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 240.0...270.0  
1000 s: (236.0...274.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.20...5.60  
Del. quantity cm<sup>3</sup>/ : 19.0...25.0  
1000 s: (15.0...29.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

#### APPLICATION

Omnibus

## Note remarks

#### 1st version

Speed rpm : 600  
Aneroid pressure h: 700  
Del.quantity : 174.0...176.0  
1000 : (171.0...179.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 118...126

#### Testing:

1st rack travel in: 12.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 80...88

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 300  
Rack travel in mm : 5.40...5.90

#### CONSTANT REGULATION

Speed rpm : 300...500

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 12.30...12.50

#### Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.50...10.70  
2nd pressure hPa : 400  
Rack travel in m: 11.40...11.60  
3rd pressure hPa : 900  
Rack travel in m: 12.40...12.60\*  
4th pressure hPa : 1100  
Rack travel in m: 12.80...13.00  
5th pressure hPa : -  
Rack travel in m: 10.10...10.30

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 196.0...199.0  
1000 s: (193.0...202.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 200.0...204.0  
1000 s: (197.0...207.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 125.0...127.0  
1000 s: (122.0...130.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,1 c  
Edition : 01.02.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 921  
  
Injection pump  
Pump designation : PE6P120A320LS7837  
EP type number : 0 412 626 842  
Governor  
Governor design. : RQ300/1050PA972-3  
Governor no. : 0 421 801 565

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm<sup>3</sup>/ : 21.1...21.3

100 s: (20.8...21.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

Del.quantity : 211.0...213.0

1000 : (208.0...216.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0



Testing:

1st rack travel in: 13.90  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.8

Testing:

Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 15.00...15.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.60...13.80

Measurement

Speed 1/min : 600

1st pressure hPa : 200  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 500  
Rack travel in m: 12.70...12.90  
3rd pressure hPa : 1000  
Rack travel in m: 13.90...14.10  
4th pressure hPa : 1200  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 8.80...9.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 1050

Del.quantity cm3/ : 242.0...245.0  
1000 s: (239.0...248.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm3/ : 244.0...248.0  
1000 s: (241.0...251.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 135.0...137.0  
1000 s: (132.0...140.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.90  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 13,8 h  
 Edition : 01.03.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 923  
 Injection pump  
 Pump designation : PE6P130A72ORS7225  
 EP type number : 0 412 636 817  
 Governor  
 Governor design. : RGV300...900PA946  
 Governor no. : 0 421 813 845

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8210.42.061

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.15...5.25  
 : (5.10...5.30)  
 Rack travel in mm : 11.50...12.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 11.60...11.70

Del.quantity cm3/ : 27.0...27.3

100 s: (26.6...27.6)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 300.0

Rack travel in mm : 3.4...3.8

Del.quantity cm3/ : 1.9...2.5

100 s: (1.5...2.9)

Spread cm3 : 1.0

100 s: (1.4)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 945  
 travel mm : 8.40...8.60

2nd speed rpm : 300  
 travel mm : 1.00...1.40

3rd speed rpm : 500  
 travel mm : 3.30...3.90

4th speed rpm : 700  
 travel mm : 5.50...5.90

5th speed rpm : 1200  
 travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 935

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 900

Del.quantity : 270.0...273.0

1000 : (266.5...276.5)

Spread cm3 : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 72...80

#### Testing:

1st rack travel in: 10.60  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 76...84

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.10  
Speed rpm : 300  
Rack travel in mm : 3.50...3.70

#### CONSTANT REGULATION

Speed rpm : 320...440

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.60...11.70

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 350  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 285  
Rack travel in m: 9.50...9.90

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 500  
Del.quantity cm3/ : 285.0...292.0  
1000 s: (285.0...292.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 175.0...185.0  
1000 s: (171.0...189.0)  
Spread cm3 : 10.00  
1000 s: (14.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 202.0...205.0  
1000 s: (198.5...208.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.60  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 300.0...330.0  
1000 s: (296.0...334.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.40...3.80  
Del.quantity cm3/ : 19.0...25.0  
1000 s: (15.0...29.0)  
Spread cm3 : 10.00  
1000 s: (14.00)

#### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (FES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,1 b  
Edition : 25.01.91  
Replaces : 30.11.90  
Test oil : ISO-4113

Combination no. : 0 402 646 925

Injection pump  
Pump designation : PE6P120A320LS7837  
EP type number : 0 412 626 842  
Governor  
Governor design. : RQV300...950PA797-20  
Governor no. : 0 421 813 893

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 252.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
                  : (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.30...14.50

Del.quantity cm3/ : 22.7...22.9

100 s: (22.4...23.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.2

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.00...1.50

2nd speed rpm : 567  
travel mm : 4.40...4.90

3rd speed rpm : 780  
travel mm : 6.10...6.60

4th speed rpm : 1009  
travel mm : 8.30...8.80

5th speed rpm : 1190  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1025

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1000  
Del.quantity : 227.0...229.0  
1000 : (224.0...232.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 120...128

Testing:  
1st rack travel in: 14.10  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1085...1115  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 82...90

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.70...6.30

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : 0.60  
2nd speed rpm : 950  
Rack travel in m: 15.10...15.30  
3rd speed rpm : 800  
Rack travel in m: 15.70...15.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.30...114.50

Measurement  
Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 640  
Rack travel in m: 13.40...13.60  
3rd pressure hPa : 1240

Rack travel in m: 14.40...14.60 \*  
4th pressure hPa : 1360  
Rack travel in m: 15.00...15.20  
5th pressure hPa : -  
Rack travel in m: 8.80...9.10

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1700  
Speed rpm : 950  
Del.quantity cm3/ : 252.0...254.0  
1000 s: (249.0...257.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1700  
Speed rpm : 800  
Del.quantity cm3/ : 263.0...265.0  
1000 s: (260.0...268.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 135.0...137.0  
1000 s: (132.0...140.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.10  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 250.0...270.0  
1000 s: (246.0...274.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 9,6 o 1  
 Edition : 27.02.91  
 Replaces : 20.12.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 926  
 Injection pump  
 Pump designation : PE6P120A320LS7834  
 EP type number : 0 412 626 841  
 Governor  
 Governor design. : RGV300...950PA797-19  
 Governor no. : 0 421 813 901

Customer spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 230.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.70...14.90

Del.quantity cm<sup>3</sup>/ : 21.9...22.1

100 s: (21.6...22.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.50

2nd speed rpm : 617  
 travel mm : 5.00...5.50

3rd speed rpm : 780  
 travel mm : 6.10...6.60

4th speed rpm : 1009  
 travel mm : 8.30...8.80

5th speed rpm : 1092  
 travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 1000  
Del. quantity : 219.0...221.0  
1000 : (216.0...224.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 13.90  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1090...1120  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 82...90

Testing:

Speed rpm : 200  
Minimum rack trave: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.50...6.80

CONSTANT REGULATION

Speed rpm : 300...500

TORQUE CONTROL

Dimension a mm : 0.40  
2nd speed rpm : 950  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 875  
Rack travel in m: 15.10...15.30  
4th speed rpm : 800  
Rack travel in m: 15.30...15.50

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.70...14.90

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.50...11.70  
2nd pressure hPa : 550

C18

Rack travel in m: 13.90...14.10  
3rd pressure hPa : 1350  
Rack travel in m: 14.80...15.00 \*  
4th pressure hPa : -  
Rack travel in m: 9.80...10.10

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 234.0...237.0  
1000 s: (231.0...240.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 241.0...245.0  
1000 s: (238.0...248.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 125.0...127.0  
1000 s: (122.0...130.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.90  
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 9,6 o 3  
 Edition : 01.03.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 929  
 Injection pump  
 Pump designation : PE6P120A320LS7834  
 EP type number : 0 412 626 841  
 Governor  
 Governor design. : RQV300...1050PA797-  
 25  
 Governor no. : 0 421 813 924

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 230.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.20...15.40

Del.quantity cm<sup>3</sup>/ : 23.1...23.3

100 s: (22.8...23.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...7.2

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.50

2nd speed rpm : 608  
 travel mm : 4.80...5.30

3rd speed rpm : 820  
 travel mm : 5.90...6.40

4th speed rpm : 1108  
 travel mm : 8.30...8.80

5th speed rpm : 1183  
 travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1085

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP



1st version  
Speed rpm : 600  
Aneroid pressure h: 1000  
Del.quantity : 231.0...233.0  
1000 : (228.0...236.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 120...128

Testing:  
1st rack travel in: 14.40  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 87...92

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.70  
Speed rpm : 300  
Rack travel in mm : 6.60...7.20

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : 0.50  
2nd speed rpm : 1050  
Rack travel in m: 15.40...15.60  
3rd speed rpm : 800  
Rack travel in m: 15.90...16.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 15.20...15.40

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 750  
Rack travel in m: 14.20...14.40

C20

3rd pressure hPa : 1400  
Rack travel in m: 15.40...15.50  
4th pressure hPa : -  
Rack travel in m: 9.70...10.00

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1700  
Speed rpm : 1050  
Del.quantity cm3/ : 232.0...235.0  
1000 s: (229.0...238.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1700  
Speed rpm : 800  
Del.quantity cm3/ : 245.0...249.0  
1000 s: (242.0...252.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.40  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 9,6 o 4  
Edition : 27.02.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 930  
  
Injection pump  
Pump designation : PE6P120A320LS7834  
EP type number : 0 412 626 841  
Governor  
Governor design. : RQ300/1050PA972-7  
Governor no. : 0 421 801 583

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 230.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.20...15.40

Del.quantity cm3/ : 23.1...23.3

100 s: (22.8...23.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.7...7.1

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 231.0...233.0

1000 : (228.0...236.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.30  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.9

Testing:

Speed rpm : 200  
Minimum rack travel: 8.70  
Speed rpm : 300  
Rack travel in mm : 6.70...7.10  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 15.30...15.50  
3rd speed rpm : 800  
Rack travel in m: 15.90...16.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 15.20...15.40

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 750  
Rack travel in m: 14.20...14.40  
3rd pressure hPa : 1400  
Rack travel in m: 15.30...15.50 \*  
4th pressure hPa : -  
Rack travel in m: 9.70...10.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1700  
Speed rpm : 1050  
Del.quantity cm3/ : 232.0...235.0  
1000 s: (229.0...238.0)

Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1700  
Speed rpm : 800  
Del.quantity cm3/ : 245.0...248.0  
1000 s: (242.0...251.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.30  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:  
\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,1 b 1  
 Edition : 27.02.91  
 Replaces : 7.1.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 931  
 Injection pump  
 Pump designation : PE6P120A320LS7837  
 EP type number : 0 412 626 842  
 Governor  
 Governor design. : RQV300...1050PA797-  
 24  
 Governor no. : 0 421 813 911

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm<sup>3</sup>/ : 21.1...21.3

100 s: (20.8...21.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.00...1.50

2nd speed rpm : 608

travel mm : 4.80...5.30

3rd speed rpm : 820

travel mm : 5.90...6.40

4th speed rpm : 1108

travel mm : 8.30...8.80

5th speed rpm : 1280

travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h : 800  
Del.quantity : 211.0...213.0  
1000 : (208.0...216.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 13.90  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 81...89

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00

CONSTANT REGULATION  
Speed rpm : 300...550

TORQUE CONTROL  
Dimension a mm : 0.10  
2nd speed rpm : 1050  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 15.00...15.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.60...13.80

Measurement  
Speed 1/min : 600

1st pressure hPa : 200  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 500  
Rack travel in m: 12.70...12.90

3rd pressure hPa : 1000  
Rack travel in m: 13.90...14.10  
4th pressure hPa : 1200  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 8.70...9.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 1050  
Del.quantity cm3/ : 242.0...245.0  
1000 s: (239.0...248.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm3/ : 244.0...248.0  
1000 s: (241.0...251.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 135.0...137.0  
1000 s: (132.0...140.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.90  
Speed rpm : 1090...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 8,7 a  
Edition : 01.03.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 932  
  
Injection pump  
Pump designation : PE6P120A32ORS7228  
EP type number : 0 412 626 845  
Governor  
Governor design. : RQV275...1150PA986  
Governor no. : 0 421 813 920

Customer-spec. information  
Customer : DAF

Engine : RS 222

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 13.80...14.80

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.50...5.70  
& maximum rack tra: 13.8...14.8  
Difference ° CS : 3.25...4.75

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.30...14.40

Del.quantity cm3/ : 17.7...17.9

100 s: (17.4...18.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0  
Rack travel in mm : 6.6...6.8  
Del.quantity cm3/ : 1.3...1.9  
100 s: (1.0...2.2)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
travel mm : 1.20...1.60  
2nd speed rpm : 315  
travel mm : 1.80...2.20  
3rd speed rpm : 1205  
travel mm : 8.10...8.50  
4th speed rpm : 1340  
travel mm : 9.70...9.90

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1200  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1000

Del.quantity : 177.0...179.0  
1000 : (174.0...182.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 13.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1320...1350  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 79...87

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.10  
Speed rpm : 275  
Rack travel in mm : 5.50...5.70

CONSTANT REGULATION  
Speed rpm : 315...365

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.30...14.40

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.60...12.80  
2nd pressure hPa : 470  
Rack travel in m: 13.90...14.00  
3rd pressure hPa : 350  
Rack travel in m: 13.00...13.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 110.0...120.0  
1000 s: (106.0...124.0)

Spread cm3 : 10.00  
1000 s: (14.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 140.0...144.0  
1000 s: (138.0...146.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.30  
Speed rpm : 1190...1200

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.50...5.70

Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 8,7 b  
 Edition : 01.03.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 933  
 Injection pump  
 Pump designation : PE6P120A320RS7228  
 EP type number : 0 412 626 845  
 Governor  
 Governor design. : RQ275/1150PA987  
 Governor no. : 0 421 801 578

Customer spec. information  
 Customer : DAF

Engine : RS 222

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 13.80...14.80

C27

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.50...5.70  
 & maximum rack tra: 13.8...14.8  
 Difference ° CS : 3.25...4.75

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.30...14.40

Del.quantity cm3/ : 17.7...17.9

100 s: (17.4...18.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 6.6...6.8

Del.quantity cm3/ : 1.3...1.9

100 s: (1.0...2.2)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.60...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 177.0...179.0

1000 : (174.0...182.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 16.0



Testing:

1st rack travel in: 13.30  
Speed rpm : 1185...1200  
2nd rack travel in: 4.00  
Speed rpm : 1270...1300  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 5.6

Testing:

Speed rpm : 100  
Minimum rack travel: 7.10  
Speed rpm : 275  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 330...370

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.30...14.40

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.60...12.80  
2nd pressure hPa : 470  
Rack travel in m: 13.90...14.00  
3rd pressure hPa : 350  
Rack travel in m: 13.00...13.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 110.0...120.0  
1000 s: (106.0...124.0)  
Spread cm3 : 10.00  
1000 s: (14.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 141.0...143.0  
1000 s: (138.0...146.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 1185...1200

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.50...5.70

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 8,7 c  
 Edition : 18.02.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 934  
 Injection pump  
 Pump designation : PE6P120A320RS7229  
 EP type number : 0 412 626 844  
 Governor  
 Governor design. : RQ275/1150PA987  
 Governor no. : 0 421 801 578

Customer-spec. information  
 Customer : DAF

Engine : RS 200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 12.40...13.40

D01

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.50...5.70  
 & maximum rack tra: 12.4...13.4  
 Difference ° CS : 3.25...4.75

## BASIC SETTING

1st speed	rpm	: 1000
Rack travel in mm		: 12.90...13.00
Del.quantity cm3/		: 15.7...15.9
	100 s:	(15.4...16.2)
Spread	cm3	: 0.5
	100 s:	(0.9)
2nd speed	rpm	: 275.0
Rack travel in mm		: 6.6...6.8
Del.quantity cm3/		: 1.3...1.9
	100 s:	(1.0...2.2)
Spread	cm3	: 0.8
	100 s:	(1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 550  
 Rack travel in mm : 15.60...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1000  
 Del.quantity : 157.0...159.0  
 1000 : (154.0...162.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 550  
 Rack travel in mm : 16.0

Testing:  
1st rack travel in: 11.90  
Speed rpm : 1185...1200  
2nd rack travel in: 4.00  
Speed rpm : 1270...1300  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.10  
Speed rpm : 275  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 330...370

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 12.90...13.00

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 180  
Rack travel in m: 12.60...12.70

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 144.5...146.5  
1000 s: (141.5...149.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1185...1200

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.50...5.70

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 8,7 d  
Edition : 18.02.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 935  
  
Injection pump  
Pump designation : PE6P120A320RS7229  
EP type number : 0 412 626 844  
Governor  
Governor design. : RQV275...1150PA986  
Governor no. : 0 421 813 920

Customer-spec. information  
Customer : DAF

Engine : RS 200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 12.40...13.40

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.50...5.70  
& maximum rack tra: 12.4...13.4  
Difference ° CS : 3.25...4.75

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 15.7...15.9

100 s: (15.4...16.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0  
Rack travel in mm : 6.6...6.8  
Del.quantity cm<sup>3</sup>/ : 1.3...1.9  
100 s: (1.0...2.2)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
travel mm : 1.20...1.60  
2nd speed rpm : 315  
travel mm : 1.80...2.20  
3rd speed rpm : 1205  
travel mm : 8.10...8.50  
4th speed rpm : 1340  
travel mm : 9.70...9.90

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1200  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1000

Del.quantity : 157.0...159.0  
1000 : (154.0...162.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 11.90  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1305...1335  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 79...87

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.10  
Speed rpm : 275  
Rack travel in mm : 5.50...5.70

CONSTANT REGULATION  
Speed rpm : 315...365

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 12.90...13.00

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 180  
Rack travel in m: 12.60...12.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 144.5...146.5  
1000 s: (141.5...149.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 1190...1200

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.50...5.70

Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,7 n  
Edition : 01.03.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 936  
Injection pump  
Pump designation : PE6P120A320RS7230  
EP type number : 0 412 626 843  
Governor  
Governor design. : RQV250...1000PA990K  
Governor no. : 0 421 815 274

Customer-spec. information  
Customer : DAF

Engine : WS 315

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 13.80...14.80

D05

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 12.80...12.90

Del.quantity cm<sup>3</sup>/ : 27.7...27.9

100 s: (27.4...28.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.8...6.0

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.30...1.70

2nd speed rpm : 285

travel mm : 2.10...2.50

3rd speed rpm : 1030

travel mm : 9.60...10.00

4th speed rpm : 1145

travel mm : 11.20...11.40

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1070

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550

Aneroid pressure h: 1500

Del.quantity : 277.0...279.0

1000 : (274.0...282.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 13.30  
Speed rpm : 1025...1040  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1275  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 70...78

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.40  
Speed rpm : 250  
Rack travel in mm : 5.80...6.00  
Rack travel in mm : 2.00  
Speed rpm : 355...395

CONSTANT REGULATION  
Speed rpm : 285...335

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 550  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 700  
Rack travel in m: 13.20...13.30  
3rd speed rpm : 800  
Rack travel in m: 13.70...13.90  
4th speed rpm : 925  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 980  
Pressure hPa : 1500  
Rack travel mm : 14.30...14.50

Measurement  
Speed 1/min : 980

1st pressure hPa : -  
Rack travel in m: 8.80...9.00  
2nd pressure hPa : 600  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 330  
Rack travel in m: 10.00...10.20

FUEL DELIVERY CHARACTERISTICS

D06

1st version  
Aneroid pressure h: 1500  
Speed rpm : 980  
Del.quantity cm3/ : 270.0...274.0  
1000 s: (267.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 162.0...164.0  
1000 s: (159.0...167.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.30  
Speed rpm : 1025...1040

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.80...6.00  
Del.quantity cm3/ : 14.0...20.0  
1000 s: (11.0...23.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 9,6 r 1  
 Edition : 01.03.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 939  
 Injection pump  
 Pump designation : PE6P120A320LS7836  
 EP type number : 0 412 626 840  
 Governor  
 Governor design. : RQV300...950PA797-31  
 Governor no. : 0 421 813 922

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 200.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.40...12.60

Del. quantity cm<sup>3</sup>/ : 17.7...17.9

100 s: (17.4...18.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.2...5.8

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.50

2nd speed rpm : 617  
 travel mm : 5.00...5.50

3rd speed rpm : 780  
 travel mm : 6.10...6.60

4th speed rpm : 1009  
 travel mm : 8.30...8.80

5th speed rpm : 1092  
 travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP



1st version  
Speed rpm : 600  
Aneroid pressure h: 750  
Del.quantity : 177.0...179.0  
1000 : (174.0...182.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 12.10  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 82...90

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.30  
Speed rpm : 300  
Rack travel in mm : 5.20...5.80

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : -  
2nd speed rpm : 950  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 800  
Rack travel in m: 13.10...13.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 750  
Rack travel mm : 12.40...12.50

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 450  
Rack travel in m: 11.60...11.80  
3rd pressure hPa : 1050

Rack travel in m: 12.50...12.70 \*  
4th pressure hPa : 1150  
Rack travel in m: 12.80...13.00  
5th pressure hPa : -  
Rack travel in m: 9.50...9.80

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 950  
Del.quantity cm3/ : 201.0...204.0  
1000 s: (198.0...207.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm3/ : 201.0...205.0  
1000 s: (198.0...208.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 117.0...119.0  
1000 s: (114.0...122.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.10  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 9,6 q 1  
 Edition : 18.02.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 940  
 Injection pump  
 Pump designation : PE6P120A320LS7836  
 EP type number : 0 412 626 840  
 Governor  
 Governor design. : RQ300/950PA971-7  
 Governor no. : 0 421 801 580

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 200.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.40...12.60

Del.quantity cm3/ : 17.7...17.9

100 s: (17.4...18.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.5...5.8

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 750

Del.quantity : 177.0...179.0

1000 : (174.0...182.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.10

Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1065...1095

4th rack travel in: 1200

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.6

Testing:

Speed rpm : 200

Minimum rack trave: 7.50

Speed rpm : 300

Rack travel in mm : 5.50...5.80

Rack travel in mm : 2.00

Speed rpm : 380...420

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 750

Rack travel mm : 12.40...12.50

Measurement

Speed 1/min : 600

1st pressure hPa : 300

Rack travel in m: 10.30...10.50

2nd pressure hPa : 450

Rack travel in m: 11.60...11.80

3rd pressure hPa : 1050

Rack travel in m: 12.50...12.70 \*

4th pressure hPa : 1150

Rack travel in m: 12.80...13.00

5th pressure hPa : -

Rack travel in m: 9.60...9.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400

Speed rpm : 950

Del.quantity cm3/ : 201.0...204.0

1000 s: (198.0...207.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1400

Speed rpm : 800

Del.quantity cm3/ : 201.0...205.0

1000 s: (198.0...208.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 117.0...119.0

1000 s: (114.0...122.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.10

Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,1 d  
Edition : 01.03.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 942  
Injection pump  
Pump designation : PE6P120A320LS7837  
EP type number : 0 412 626 842  
Governor  
Governor design. : RQ300/1050PA993  
Governor no. : 0 421 801 581

Customer spec. information  
Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
(5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm3/ : 21.1...21.3

100 s: (20.8...21.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

Del.quantity : 211.0...213.0

1000 : (208.0...216.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 13.90  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.8

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL  
Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 15.00...15.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.60...13.80

Measurement  
Speed 1/min : 600

1st pressure hPa : 200  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 500  
Rack travel in m: 12.70...12.90  
3rd pressure hPa : 1000  
Rack travel in m: 13.90...14.10  
4th pressure hPa : 1200  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 8.80...9.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 1050

Del.quantity cm<sup>3</sup>/ : 242.0...245.0  
1000 s: (239.0...248.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 244.0...248.0  
1000 s: (241.0...251.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 135.0...137.0  
1000 s: (132.0...140.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.90  
Speed rpm : 1090...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

## Note remarks

Combination no. : 0 402 646 943

Customer spec. information  
Customer : MERCEDES-BENZ

1st version kW : 250.0  
Rated speed : 1900

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

```
Test nozzle holder
assembly          : 1 688 901 105
```

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

```
Prestroke mm      : 5.20...5.30
                   : (5.15...5.35)
Rack travel in mm : 20.00...21.00
Firing order      : 6- 3- 5- 2- 4- 1
```

Phasing : 0-60-120-180-240-300

Tolerance  $\pm$  ° : 0.50 (0.75)

Time to cyl. no. : 6

1st speed      rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm<sup>3</sup>/ : ~~22.1...22.3~~

100 s: (21.8...22.6)

Spread            cm<sup>3</sup> : 0.5

100 s: (0.9)

```

2nd speed      rpm : 300.0
Rack travel in mm : 5.7...6.0
Del.quantity   cm3/ : 1.6...2.2
               100 s: (1.3...2.5)
Spread         cm3 : 0.6
               100 s: (1.0)

```

(B) Setting of injection pump  
with governor

1st speed	rpm	: 300
travel mm		: 1.00...1.50
2nd speed	rpm	: 567
travel mm		: 4.40...4.90
3rd speed	rpm	: 780
travel mm		: 6.10...6.60
4th speed	rpm	: 1009
travel mm		: 8.30...8.80
5th speed	rpm	: 1092
travel mm		: 9.80...10.30

```
Control-lever position
Degree: -1
Speed      rpm : 1090
Rack travel in mm : 15.20...17.80
```

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 950  
Del.quantity : 221.0...223.0  
1000 : (218.0...226.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 95...103

Testing:  
1st rack travel in: 14.10  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 69...77

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00

CONSTANT REGULATION  
Speed rpm : 300...500

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.90...14.10

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 600  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1150  
Rack travel in m: 14.20...14.40  
4th pressure hPa : 1250  
Rack travel in m: 14.70...14.90  
5th pressure hPa : -  
Rack travel in m: 9.20...9.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1550  
Speed rpm : 950  
Del.quantity cm3/ : 251.0...254.0  
1000 s: (248.0...257.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1550  
Speed rpm : 750  
Del.quantity cm3/ : 242.0...246.0  
1000 s: (239.0...249.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 138.0...140.0  
1000 s: (135.0...143.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.10  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,0 t11  
 Edition : 01.02.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 944  
 Injection pump  
 Pump designation : PE6P120A320LS7808  
 EP type number : 0 412 626 816  
 Governor  
 Governor design. : RQV300...1050PA797-  
 29  
 Governor no. : 0 421 813 926  
 Customer-spec. information  
 Customer : MERCEDES-BENZ  
 Engine : OM441 LA  
 1st version kW : 250.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 100...120  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 14.10...14.30  
 Del.quantity cm3/ : 21.6...21.8  
 100 s: (21.3...22.1)  
 Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.7...6.0  
 Del.quantity cm3/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm3 : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.50  
 2nd speed rpm : 608  
 travel mm : 4.80...5.30  
 3rd speed rpm : 820  
 travel mm : 5.90...6.40  
 4th speed rpm : 1108  
 travel mm : 8.30...8.80  
 5th speed rpm : 1183  
 travel mm : 9.60...10.30

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1090  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP



1st version

Speed rpm : 600  
Aneroid pressure h: 750  
Del. quantity : 216.0...218.0  
1000 : (213.0...221.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 14.30  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 54...62

Testing:

Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00

CONSTANT REGULATION

Speed rpm : 300...500

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 750  
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600

1st pressure hPa : 200  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 500  
Rack travel in m: 13.00...13.20  
3rd pressure hPa : 950  
Rack travel in m: 14.20...14.40 \*  
4th pressure hPa : 1150  
Rack travel in m: 14.80...15.00  
5th pressure hPa : -  
Rack travel in m: 9.20...9.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1350  
Speed rpm : 1050  
Del. quantity cm3/ : 243.0...245.0  
1000 s: (240.0...248.0)  
Spread cm3 : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1350  
Speed rpm : 750  
Del. quantity cm3/ : 239.0...243.0  
1000 s: (236.0...246.0)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Speed rpm : 500  
Del. quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.30  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 14,0 h6  
 Edition : 06.04.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 860  
 Injection pump  
 Pump designation : PE8P120A920/4LS7125  
 EP type number : 0 412 628 833  
 Governor  
 Governor design. : RQV200...1050PA736-6  
 Governor no. : 0 421 813 740

Customer spec. information  
 Customer : SCANIA

Engine : DS14,DSC14

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

D17

Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.50...13.60

Del.quantity cm3/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.9...5.3

Del.quantity cm3/ : 1.6...2.0

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 1.20...1.60

2nd speed rpm : 350  
 travel mm : 2.30...2.90

3rd speed rpm : 650  
 travel mm : 4.00...4.60

4th speed rpm : 1095  
 travel mm : 8.20...8.40

5th speed rpm : 1215  
 travel mm : 9.70...10.10

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 214.0...216.0

1000 : (211.0...219.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Testing:  
1st rack travel in: 12.50  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 380...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.50...13.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.20...11.60  
2nd pressure hPa : 365  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 215  
Rack travel in m: 11.90...12.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 205.0...213.0  
1000 s: (203.0...215.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 158.0...162.0  
1000 s: (156.0...164.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

Remarks:

:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 t 1  
Edition : 16.01.91  
Replaces : 30.3.90  
Test oil : ISO-4113

Combination no. : 0 402 648 889

Injection pump  
Pump designation : PE8P120A320LS7816  
EP type number : 0 412 628 829  
Governor  
Governor design. : RQ300/950PA932-2  
Governor no. : 0 421 801 526

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 362.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
(5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.60...14.80

Del.quantity cm<sup>3</sup>/ : 25.4...25.6

100 s: (25.1...25.9)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 254.0...256.0

1000 : (251.0...259.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.20  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1150  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.90  
2nd speed rpm : 950  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 800  
Rack travel in m: 15.50...15.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.60...14.80

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.60...11.80  
2nd pressure hPa : 700  
Rack travel in m: 13.80...14.00  
3rd pressure hPa : 1200  
Rack travel in m: 14.80...15.00  
4th pressure hPa : 1300  
Rack travel in m: 15.20...15.40  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 950

Del.quantity cm<sup>3</sup>/ : 270.0...273.0  
1000 s: (267.0...276.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 270.0...274.0  
1000 s: (267.0...277.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.20  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 12,8 o 2  
 Edition : 27.02.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 895  
 Injection pump  
 Pump designation : PE8P120A320LS7835  
 EP type number : 0 412 628 847  
 Governor  
 Governor design. : RQ300/1050PA972-1  
 Governor no. : 0 421 801 545

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 A

1st version kW : 280.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.60...14.80

Del.quantity cm3/ : 22.1...22.3

100 s: (21.8...22.6)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.2...6.8  
 Del.quantity cm3/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm3 : 0.6  
 100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 900  
 Del.quantity : 221.0...223.0  
 1000 : (218.0...226.0)  
 Spread cm3 : 6.00  
 1000 : (9.00)

## RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.30  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.50  
2nd speed rpm : 950  
Rack travel in m: 14.30...14.50  
3rd speed rpm : 800  
Rack travel in m: 14.90...15.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.60...14.80

Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 600  
Rack travel in m: 13.30...13.50  
3rd pressure hPa : 1100  
Rack travel in m: 14.70...14.80 \*  
4th pressure hPa : -  
Rack travel in m: 9.00...9.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 1050  
Del.quantity cm3/ : 222.0...225.0  
1000 s: (219.0...228.0)

Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm3/ : 234.0...238.0  
1000 s: (231.0...241.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 w 2  
 Edition : 27.02.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 898  
 Injection pump  
 Pump designation : PE8P120A320LS7838  
 EP type number : 0 412 628 848  
 Governor  
 Governor design. : RQ300/950PA971-4  
 Governor no. : 0 421 801 558

## Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 320.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.60...14.80

Del.quantity cm3/ : 22.2...22.4

100 s: (21.9...22.7)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 950

Del.quantity : 222.0...224.0

1000 : (219.0...227.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600



Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.30

Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1070...1100

4th rack travel in: 1150

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.5

Testing:

Speed rpm : 200

Minimum rack travel: 7.80

Speed rpm : 300

Rack travel in mm : 6.20...6.80

Rack travel in mm : 2.00

Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?

2nd speed rpm : 950

Rack travel in m: 15.30...15.50

3rd speed rpm : 800

Rack travel in m: 15.90...16.10

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 950

Rack travel mm : 14.60...14.80

Measurement

Speed 1/min : 600

1st pressure hPa : 300

Rack travel in m: 10.60...10.80

2nd pressure hPa : 680

Rack travel in m: 14.00...14.20

3rd pressure hPa : 1100

Rack travel in m: 14.90...15.10

4th pressure hPa : 1200

Rack travel in m: 15.50...15.70

5th pressure hPa : -

Rack travel in m: 8.80...9.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400

Speed rpm : 950

Del.quantity cm<sup>3</sup>/ : 243.0...245.0

1000 s: (240.0...248.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

Aneroid pressure h: 1400

Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 255.0...259.0

1000 s: (252.0...262.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 125.0...127.0

1000 s: (122.0...130.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.30

Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 v 2  
 Edition : 27.02.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 899  
 Injection pump  
 Pump designation : PE8P120A320LS7839  
 EP type number : 0 412 628 849  
 Governor  
 Governor design. : RQ300/950PA971-5  
 Governor no. : 0 421 801 559

Customer spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.10...14.30

Del.quantity cm<sup>3</sup>/ : 25.2...25.4

100 s: (24.9...25.7)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.2...5.8  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1050  
 Del.quantity : 252.0...254.0  
 1000 : (249.0...257.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

## RATED SPEED

1st version

Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.70

Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1065...1095

4th rack travel in: 1150

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.5

Testing:

Speed rpm : 200

Minimum rack travel: 6.80

Speed rpm : 300

Rack travel in mm : 5.20...5.80

Rack travel in mm : 2.00

Speed rpm : 370...410

TORQUE CONTROL

Dimension a mm : ?

2nd speed rpm : 950

Rack travel in m: 15.70...15.90

3rd speed rpm : 800

Rack travel in m: 16.00...16.20

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 1050

Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600

1st pressure hPa : 290

Rack travel in m: 8.70...8.90

2nd pressure hPa : 780

Rack travel in m: 13.20...13.40

3rd pressure hPa : 1200

Rack travel in m: 14.30...14.50

4th pressure hPa : 1380

Rack travel in m: 15.10...15.30

5th pressure hPa : -

Rack travel in m: 8.40...8.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1800

Speed rpm : 950

Del.quantity cm<sup>3</sup>/ : 290.0...293.0

1000 s: (287.0...296.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

Aneroid pressure h: 1800

Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 295.0...299.0

1000 s: (292.0...302.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 139.0...141.0

1000 s: (136.0...144.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.70

Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 a24  
Edition : 27.02.91  
Replaces : 30.11.90  
Test oil : ISO-4113

Combination no. : 0 402 648 903

Injection pump  
Pump designation : PE8P120A320LS7801-1  
EP type number : 0 412 628 818  
Governor  
Governor design. : RQV350...1050PA866-8  
Governor no. : 0 421 813 905

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 260.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
(5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 13.90...14.10

Del.quantity cm3/ : 20.1...20.3

100 s: (19.8...20.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...5.5

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.30...1.80

2nd speed rpm : 570  
travel mm : 3.30...3.80

3rd speed rpm : 900  
travel mm : 5.40...5.90

4th speed rpm : 1107  
travel mm : 7.80...8.30

5th speed rpm : 1204  
travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 500  
Aneroid pressure h: 650  
Del.quantity : 201.0...203.0  
1000 : (198.0...206.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

#### Testing:

1st rack travel in: 11.50  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 65...73

#### Testing:

Speed rpm : 250  
Mini. mm rack trave: 7.60  
Speed rpm : 350  
Rack travel in mm : 5.00...5.50

#### CONSTANT REGULATION

Speed rpm : 350...550

#### TORQUE CONTROL

Dimension a mm : 1.60  
2nd speed rpm : 1050  
Rack travel in m: 12.50...12.70  
3rd speed rpm : 700  
Rack travel in m: 14.10...14.30

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 13.90...14.10

#### Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 375  
Rack travel in m: 13.30...13.50

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3rd pressure hPa : 900  
Rack travel in m: 14.00...14.10 \*  
4th pressure hPa : -  
Rack travel in m: 10.9\_ 11.20

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1050  
Del.quantity cm3/ : 180.0...183.0  
1000 s: (177.0...186.0)  
Spread cm3 : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1100  
Speed rpm : 700  
Del.quantity cm3/ : 213.0...217.0  
1000 s: (210.0...220.0)  
Speed rpm : 500  
Del.quantity cm3/ : 147.0...149.0  
1000 s: (144.0...152.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 11.50  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...200.0  
1000 s: (176.0...204.0)

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 w 1  
 Edition : 27.02.91  
 Replaces : 16.1.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 908  
 Injection pump  
 Pump designation : PE8P120A320LS7838  
 EP type number : 0 412 628 848  
 Governor  
 Governor design. : RQV300...950PA797-23  
 Governor no. : 0 421 813 910

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 320.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.60...14.80

Del.quantity cm3/ : 22.2...22.4

100 s: (21.9...22.7)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.50

2nd speed rpm : 617  
 travel mm : 5.00...5.50

3rd speed rpm : 780  
 travel mm : 6.10...6.60

4th speed rpm : 1009  
 travel mm : 8.30...8.80

5th speed rpm : 1092  
 travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 222.0...224.0  
1000 : (219.0...227.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 120...128

Testing:

1st rack travel in: 14.30  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 82...90

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.80

CONSTANT REGULATION

Speed rpm : 300...500

TORQUE CONTROL

Dimension a mm : 0.60  
2nd speed rpm : 950  
Rack travel in m: 15.30...15.50  
3rd speed rpm : 800  
Rack travel in m: 15.90...16.10

Aneroid/Altitude

Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.60...14.80

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 680  
Rack travel in m: 14.00...14.20

3rd pressure hPa : 1100  
Rack travel in m: 14.90...15.10  
4th pressure hPa : 1200  
Rack travel in m: 15.40...15.60  
5th pressure hPa : -  
Rack travel in m: 8.70...8.90

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 243.0...246.0  
1000 s: (240.0...249.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 255.0...259.0  
1000 s: (252.0...262.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 125.0...127.0  
1000 s: (122.0...130.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 14.30  
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 u 2  
 Edition : 27.02.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 909  
 Injection pump  
 Pump designation : PE8P120A320LS7840  
 EP type number : 0 412 628 850  
 Governor  
 Governor design. : RQ300/950PA971-6  
 Governor no. : 0 421 801 575

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 250.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm3/ : 20.7...20.9

100 s: (20.4...21.2)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

Del.quantity : 207.0...209.0

1000 : (204.0...212.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600



Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.80  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1150  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.90...14.10

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 550  
Rack travel in m: 12.70...12.90  
3rd pressure hPa : 1050  
Rack travel in m: 14.00...14.20 \*  
4th pressure hPa : 1150  
Rack travel in m: 14.40...14.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 205.0...208.0  
1000 s: (202.0...211.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 236.0...240.0  
1000 s: (233.0...243.0)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 123.0...125.0  
1000 s: (120.0...128.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 u 3  
 Edition : 01.03.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 910  
 Injection pump  
 Pump designation : PE8P120A320LS7840  
 EP type number : 0 412 628 850  
 Governor  
 Governor design. : RQV300...950PA797-26  
 Governor no. : 0 421 813 915

## Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 250.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.40...13.60

Del.quantity cm3/ : 20.7...20.9

100 s: (20.4...21.2)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.50

2nd speed rpm : 617  
 travel mm : 5.00...5.50

3rd speed rpm : 780  
 travel mm : 6.10...6.60

4th speed rpm : 1009  
 travel mm : 8.30...8.80

5th speed rpm : 1092  
 travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 800  
Del.quantity : 207.0...209.0  
1000 : (204.0...212.0)  
Spread cm3 : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 12.10  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 82...90

Testing:  
Speed rpm : 200  
Minimum rack trave: 7.60  
Speed rpm : 300  
Rack travel in mm : 6.00...6.60

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : 1.00  
2nd speed rpm : 950  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 800  
Rack travel in m: 14.10...14.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.40...13.60

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 500  
Rack travel in m: 12.80...13.00

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3rd pressure hPa : 1050  
Rack travel in m: 13.80...14.00  
4th pressure hPa : -  
Rack travel in m: 10.30...10.60

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 950  
Del.quantity cm3/ : 205.0...208.0  
1000 s: (202.0...211.0)  
Spread cm3 : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm3/ : 236.0...240.0  
1000 s: (233.0...243.0)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Speed rpm : 500  
Del.quantity cm3/ : 123.0...125.0  
1000 s: (120.0...128.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.10  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 g 7  
Edition : 01.03.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 678 814  
  
Injection pump  
Pump designation : PE8P120A320LS7801-1  
EP type number : 0 412 628 818  
Governor  
Governor design. : RSV350...1050POA535  
Governor no. : 0 421 833 352

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442LA

1st version kW : 260.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (4.15...5.35)  
Rack travel in mm : 9.00...12.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 13.90...14.10

Del.quantity cm<sup>3</sup>/ : 20.1...20.3

100 s: (19.8...20.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 5.6...5.8  
Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 500  
Aneroid pressure h: 700  
Del.quantity : 201.0...203.0  
1000 : (198.0...206.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 86...94

Testing:  
1st rack travel in: 12.00  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1140...1158  
4th rack travel in: 1400  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 63...71  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.7

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 360...420

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 13.00...13.20  
2nd speed rpm : 700  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 900  
Rack travel in m: 13.50...13.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 13.90...14.10

Measurement  
Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 500  
Rack travel in m: 13.20...13.40  
3rd pressure hPa : 925  
Rack travel in m: 14.10...14.20  
4th pressure hPa : -  
Rack travel in m: 11.80...12.00

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 1030  
Del.quantity cm3/ : 181.0...184.0  
1000 s: (178.0...187.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1100  
Speed rpm : 700  
Del.quantity cm3/ : 213.0...217.0  
1000 s: (210.0...220.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 143.0...145.0  
1000 s: (140.0...148.0)  
Spread cm3 : 8.00  
1000 s: (-)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.00

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...200.0  
1000 s: (176.0...204.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 r  
Edition : 18.02.91  
Replaces : 14.12.90  
Test oil : ISO-4113  
  
Combination no. : 0 402 736 807  
  
Injection pump  
Pump designation : PES6P110A120RS7214  
EP type number : 0 412 716 805  
Governor  
Governor design. : RQV350...1100PA964-1  
K  
Governor no. : 0 421 815 253

Customer-spec. information  
Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 201.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 115...125

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
(4.30...4.50)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 15.70...15.80

Del.quantity cm<sup>3</sup>/ : 20.6...20.8  
100 s: (20.3...21.1)

Spread cm<sup>3</sup> : 0.5  
100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 5.7...5.9  
Del.quantity cm<sup>3</sup>/ : 2.7...3.3  
100 s: (2.5...3.5)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.80...2.00  
2nd speed rpm : 450  
travel mm : 3.10...3.50  
3rd speed rpm : 600  
travel mm : 5.10...5.50  
4th speed rpm : 1000  
travel mm : 8.10...8.30  
5th speed rpm : 1200  
travel mm : 9.60...10.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Aneroid pressure h: 1500  
Del.quantity : 206.0...208.0  
1000 : (203.0...211.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 64...72

#### Testing:

1st rack travel in: 14.40  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.8

#### Testing:

Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.70...5.90

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 15.70...15.80  
2nd speed rpm : 650  
Rack travel in m: 13.20...13.60  
3rd speed rpm : 1100  
Rack travel in m: 15.40...15.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1050  
Pressure hPa : 1500  
Rack travel mm : 15.70...15.80

#### Measurement

Speed 1/min : 1050

1st pressure hPa : -  
Rack travel in m: 8.40...8.80  
2nd pressure hPa : 340  
Rack travel in m: 10.20...10.30

3rd pressure hPa : 840  
Rack travel in m: 13.60...14.00

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1500  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 187.5...193.5  
1000 s: (184.5...196.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 98.0...102.0  
1000 s: (96.0...104.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.40  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 11.00...12.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C # 3916627

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

#### Bow dimension:

Sliding-sleeve position = 37.0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 5,9 w 1  
 Edition : 14.12.90  
 Replaces : 15.11.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 810  
 Injection pump  
 Pump designation : PES6P110A120RS7213  
 EP type number : 0 412 716 804  
 Governor  
 Governor design. : RQV400...1250PA964-2  
 K  
 Governor no. : 0 421 815 254

Customer spec. information  
 Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 141.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 14.80...14.90

Del.quantity cm3/ : 15.9...16.1

100 s: (15.6...16.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 0.70...1.10

2nd speed rpm : 400  
 travel mm : 1.40...1.60

3rd speed rpm : 600  
 travel mm : 2.90...3.30

4th speed rpm : 1300  
 travel mm : 7.20...7.40

5th speed rpm : 1500  
 travel mm : 9.10...9.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Aneroid pressure h: 1200  
 Del.quantity : 159.0...161.0  
 1000 : (156.0...164.0)





# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 5,9 w 2  
 Edition : 18.02.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 811  
 Injection pump  
 Pump designation : PES6P110A120RS7213  
 EP type number : 0 412 716 804  
 Governor  
 Governor design. : RQV400...1250PA964-3  
 K  
 Governor no. : 0 421 815 255

Customer-spec. information  
 Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 147.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 14.80...14.90

Del.quantity cm3/ : 15.8...16.0

100 s: (15.5...16.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 0.70...1.10

2nd speed rpm : 400

travel mm : 1.40...1.60

3rd speed rpm : 600

travel mm : 2.90...3.30

4th speed rpm : 1300

travel mm : 7.20...7.40

5th speed rpm : 1500

travel mm : 9.10...9.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1200

Del.quantity : 158.5...160.5

1000 : (155.5...163.5)

Spread      cm<sup>3</sup> : 5.00  
             1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 13.80  
Speed      rpm : 1290...1320  
2nd rack travel in: 4.00  
Speed      rpm : 1470...1480  
4th rack travel in: 1600  
Speed      rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 12...20

Testing:  
Speed      rpm : 275  
Minimum rack travel: 7.20  
Speed      rpm : 400  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed      rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed      rpm : 1250  
Rack travel in m: 14.80...14.90  
2nd speed      rpm : 800  
Rack travel in m: 13.20...13.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed      rpm : 1250  
Pressure    hPa : 1200  
Rack travel mm : 14.80...14.90

Measurement  
Speed      1/min : 1250

1st pressure hPa : -  
Rack travel in m: 8.20...8.60  
2nd pressure hPa : 410  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 755  
Rack travel in m: 13.10...13.50

#### START CUT-OUT

Speed      1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed      rpm : 800  
Del.quantity cm<sup>3</sup>/ : 156.5...162.5  
             1000 s: (153.5...165.5)  
Spread      cm<sup>3</sup> : 8.00  
             1000 s: (12.0)  
Aneroid pressure h: -  
Speed      rpm : 500  
Del.quantity cm<sup>3</sup>/ : 90.0...94.0  
             1000 s: (88.0...96.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
  
full load rack tr: 13.80  
Speed      rpm : 1290...1320

#### STARTING FUEL DELIVERY

Speed      rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
             1000 s: (135.0...165.0)  
Rack travel in mm : 11.90...12.90

#### LOW IDLE

Speed      rpm : 400  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
             1000 s: (30.0...40.0)  
Spread      cm<sup>3</sup> : 8.00  
             1000 s: (12.00)

Remarks:  
                                 : C.D.C # 3918321

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 r 3  
 Edition : 18.02.91  
 Replaces : 15.11.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 812  
 Injection pump  
 Pump designation : PES6P110A120RS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1200PA964-4  
 K  
 Governor no. : 0 421 815 256

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 156.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 14.7...14.9  
 100 s: (14.4...15.2)

Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.7...5.9  
 Del.quantity cm3/ : 2.7...3.3  
 100 s: (2.5...3.5)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.80...2.00  
 2nd speed rpm : 450  
 travel mm : 3.10...3.50  
 3rd speed rpm : 700  
 travel mm : 5.90...6.30  
 4th speed rpm : 1200  
 travel mm : 9.00...9.20  
 5th speed rpm : 1400  
 travel mm : 10.70...11.10

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 1200  
 Del.quantity : 147.5...149.5  
 1000 : (144.5...152.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 60...68

Testing:  
1st rack travel in: 11.60  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1375...1405  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 12.60...12.70  
2nd speed rpm : 650  
Rack travel in m: 11.20...11.60  
3rd speed rpm : 550  
Rack travel in m: 11.10...11.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1200  
Pressure hPa : 1200  
Rack travel mm : 12.60...12.70

Measurement  
Speed 1/min : 1200

1st pressure hPa : -  
Rack travel in m: 8.00...8.40  
2nd pressure hPa : 225  
Rack travel in m: 9.20...9.30  
3rd pressure hPa : 515  
Rack travel in m: 11.10...11.50

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 151.0...157.0  
1000 s: (148.0...160.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 90.0...94.0  
1000 s: (88.0...96.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.60  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 11.00...12.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:  
: C.D.C # 3917088

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

Bow dimension:  
Sliding-sleeve position = 37.0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 11,9 t2  
Edition : 18.02.91  
Replaces : 1.2.91  
Test oil : ISO-4113

Combination no. : 0 402 736 817

Injection pump  
Pump designation : PES6P120A720/3LS7209  
EP type number : 0 412 726 837  
Governor  
Governor design. : RQV300...1000PA962-3  
K  
Governor no. : 0 421 815 270

Customer-spec. information  
Customer : MAN

Engine : D2866LF09

1st version kW : 309.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
(4.75...4.95)  
Rack travel in mm : 15.00...16.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60  
& maximum rack tra: 15.0...16.0  
Difference ° CS : 1.75...3.25

## BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 13.20...13.30

Del. quantity cm<sup>3</sup>/ : 28.8...29.0

100 s: (28.5...29.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.8...5.2

Del. quantity cm<sup>3</sup>/ : 2.0...2.6

100 s: (1.7...2.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
travel mm : 8.30...8.50

2nd speed rpm : 300  
travel mm : 1.90...2.30

3rd speed rpm : 500  
travel mm : 4.00...4.60

4th speed rpm : 900  
travel mm : 6.50...6.90

5th speed rpm : 1350  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750  
Aneroid pressure h: 1300  
Del.quantity : 288.0...290.0  
1000 : (285.0...293.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control Lever  
position degrees: 284...292

Testing:

1st rack travel in: 12.60  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever  
position degrees: 239...247

Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 300...420

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.10...14.20  
2nd speed rpm : 1000  
Rack travel in m: 13.60...13.80  
3rd speed rpm : 750  
Rack travel in m: 13.20...13.40  
4th speed rpm : 400  
Rack travel in m: 12.20...12.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1300  
Rack travel mm : 14.10...14.20

Measurement

Speed 1/min : 900

1st pressure hPa : -

Rack travel in m: 9.00...9.20

2nd pressure hPa : 220

Rack travel in m: 9.30...9.40

3rd pressure hPa : 720

Rack travel in m: 11.70...11.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 302.0...308.0  
1000 s: (299.0...311.0)  
Aneroid pressure h: 1300  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 276.0...282.0  
1000 s: (273.0...285.0)  
Aneroid pressure h: -  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 102.0...112.0  
1000 s: (99.0...115.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 168.0...170.0  
1000 s: (165.0...173.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.60

Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.80...5.20  
Del.quantity cm<sup>3</sup>/ : 20.0...26.0  
1000 s: (17.0...29.0)

Spread      cm<sup>3</sup> : 8.00  
             1000 s: (12.00)

Remarks:  
                 : MAN-NR. 3-7094

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 11,9 t3  
Edition : 18.02.91  
Replaces : 14.12.90  
Test oil : ISO-4113

Combination no. : 0 402 736 818

Injection pump  
Pump designation : PES6P120A720/3LS7209  
EP type number : 0 412 726 837  
Governor  
Governor design. : RQV300...1000PA960-4  
K  
Governor no. : 0 421 815 272

Customer-spec. information  
Customer : MAN

Engine : D2866LF09

1st version kW : 309.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness : 6.00X1.50X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
: (4.75...4.95)  
Rack travel in mm : 15.00...16.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60  
& maximum rack tra: 15.0...16.0  
Difference ° CS : 1.75...3.25

## BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 13.20...13.30

Del. quantity cm<sup>3</sup>/ : 28.8...29.0

100 s: (28.5...29.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 4.8...5.2  
Del. quantity cm<sup>3</sup>/ : 2.0...2.6  
100 s: (1.7...2.9)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
travel mm : 9.50...9.70  
2nd speed rpm : 300  
travel mm : 1.40...1.80  
3rd speed rpm : 500  
travel mm : 3.50...4.10  
4th speed rpm : 900  
travel mm : 7.70...8.10  
5th speed rpm : 1350  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750  
Aneroid pressure h : 1300  
Del.quantity : 288.0...290.0  
1000 : (285.0...293.0)  
Spread cm3 : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 294...302

Testing:

1st rack travel in: 12.60  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 247...255

Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 300...420

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.10...14.20  
2nd speed rpm : 1000  
Rack travel in m: 13.60...13.80  
3rd speed rpm : 750  
Rack travel in m: 13.20...13.40  
4th speed rpm : 400  
Rack travel in m: 12.20...12.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1300  
Rack travel mm : 14.10...14.20

E21

Measurement

Speed 1/min : 900

1st pressure hPa : -

Rack travel in m: 9.00...9.20

2nd pressure hPa : 220

Rack travel in m: 9.30...9.40

3rd pressure hPa : 720

Rack travel in m: 11.70...11.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300  
Speed rpm : 900  
Del.quantity cm3/ : 302.0...308.0  
1000 s: (299.0...311.0)  
Aneroid pressure h: 1300  
Speed rpm : 1000  
Del.quantity cm3/ : 276.0...282.0  
1000 s: (273.0...285.0)  
Aneroid pressure h: -  
Speed rpm : 750  
Del.quantity cm3/ : 102.0...112.0  
1000 s: (99.0...115.0)  
Spread cm3 : 10.00  
1000 s: (14.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 168.0...170.0  
1000 s: (165.0...173.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.60

Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.80...5.20  
Del.quantity cm3/ : 20.0...26.0  
1000 s: (17.0...29.0)

Spread        cm<sup>3</sup> : 8.00  
              1000 s: (12.00)

Remarks:  
                 : MAN-NR. 3-7095

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a9  
 Edition : 25.2.91  
 Replaces : 30.10.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 833  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...975PA848-11  
 K  
 Governor no. : 0 421 815 190

Customer spec. information  
 Customer : MACK

Engine : E6-350 2VH

1st version kW : 257.0  
 Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

E23

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 14.10...14.20

Del.quantity cm3/ : 23.0...23.2

100 s: (22.7...23.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.8...4.4  
 100 s: (3.6...4.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.40...1.60

2nd speed r : 450  
 travel mm : 2.50...2.80

3rd speed rpm : 800  
 travel mm : 4.80...5.00

4th speed rpm : 1050  
 travel mm : 7.30...7.60

5th speed rpm : 1200  
 travel mm : 9.40...9.60

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1190

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 975

Aneroid pressure h: 900  
Del.quantity : 230.5...232.5  
1000 : (227.5...235.5)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 13.10  
Speed rpm : 1015...1025  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

#### CONSTANT REGULATION

Speed rpm : 325...600

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 975  
Rack travel in m: 14.10...14.20  
2nd speed rpm : 700  
Rack travel in m: 13.70...13.90  
3rd speed rpm : 600  
Rack travel in m: 0.00...13.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 700  
Pressure hPa : 900  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 700

1st pressure hPa : -  
Rack travel in m: 7.80...8.20  
2nd pressure hPa : 240  
Rack travel in m: 9.30...9.40

3rd pressure hPa : 510  
Rack travel in m: 12.20...12.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 227.0...233.0  
1000 s: (224.0...236.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 125.0...129.0  
1000 s: (123.0...131.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.10  
Speed rpm : 1015...1025

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 110.0...150.0  
1000 s: (100.0...160.0)  
Rack travel in mm : 7.80...8.20

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 9,5 e  
 Edition : 27.02.91  
 Replaces : 16.2.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 834  
 Injection pump  
 Pump designation : PES6P120A.720RS7154  
 EP type number : 0 412 726 811  
 Governor  
 Governor design. : RQV275...1100PA888K  
 Governor no. : 0 421 815 191

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8460.41.102

1st version kW : 235.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.60...11.70

Del.quantity cm3/ : 19.8...20.0

100 s: (19.5...20.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 2.0...2.6

100 s: (1.7...2.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 3.00...3.80

3rd speed rpm : 800  
 travel mm : 6.20...6.60

4th speed rpm : 1100  
 travel mm : 9.70...9.90

5th speed rpm : 1350  
 travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 198.0...200.0  
1000 : (195.0...203.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 118...126

Testing:  
1st rack travel in: 10.60  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 68...76

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 275  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 280...400

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 1100  
Rack travel in m: 11.60...11.70  
3rd speed rpm : 950  
Rack travel in m: 11.80...12.10  
4th speed rpm : 750  
Rack travel in m: 11.80...12.10  
5th speed rpm : 400  
Rack travel in m: 11.20...11.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 850  
Pressure hPa : 1200  
Rack travel mm : 12.00...12.10

Measurement  
Speed 1/min : 850

1st pressure hPa : -

E26

Rack travel in m: 9.00...9.40  
2nd pressure hPa : 515  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 305  
Rack travel in m: 9.50...9.70

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm3/ : 212.0...218.0  
1000 s: (209.0...221.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 127.0...129.0  
1000 s: (124.0...132.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack travel: 10.60  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...150.0  
1000 s: (116.0...154.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 6,2 i  
 Edition : 18.02.91  
 Replaces : 28.11.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 894  
 Injection pump  
 Pump designation : PES6P110A32ORS7208  
 EP type number : 0 412 716 803  
 Governor  
 Governor design. : RQV275...1175PA942-1  
 K  
 Governor no. : 0 421 815 244

Customer-spec. information  
 Customer : RVI

Engine : MIDR060226 M

1st version kW : 210.0  
 Rated speed : 2350

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.10...4.20  
 : (4.05...4.25)

Rack travel in mm : 13.00...14.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 14.00...14.10  
 & maximum rack tra: 20.0...21.0  
 Difference ° CS : 2.75...4.25

## BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 14.00...14.10

Del. quantity cm<sup>3</sup>/ : 17.0...17.2  
 100 s: (16.7...17.4)

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

2nd speed rpm : 275.0  
 Rack travel in mm : 5.00...5.60  
 Del. quantity cm<sup>3</sup>/ : 2.0...2.5  
 100 s: (1.7...2.7)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1320  
 travel mm : 9.70...9.90  
 2nd speed rpm : 275  
 travel mm : 0.90...1.10  
 3rd speed rpm : 600  
 travel mm : 4.20...4.60  
 4th speed rpm : 1000  
 travel mm : 7.10...7.50  
 5th speed rpm : 1600  
 travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1370  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP



1st version  
Speed rpm : 1175  
Aneroid pressure h: 1000  
Del.quantity : 170.0...172.0  
1000 : (167.5...174.5)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 13.00  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 56...64

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.90  
Speed rpm : 275  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION  
Speed rpm : 350...480

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 700  
Rack travel in m: 13.25...13.45  
3rd speed rpm : 800  
Rack travel in m: 13.50...13.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1175  
Pressure hPa : 1000  
Rack travel mm : 14.00...14.10

Measurement  
Speed 1/min : 1175

1st pressure hPa : -

E28

Rack travel in m: 10.30...10.90  
2nd pressure hPa : 520  
Rack travel in m: 12.30...12.50  
3rd pressure hPa : 240  
Rack travel in m: 10.90...11.30

#### START CUT-OUT

Speed 1/min : 215 (235)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 148.0...154.0  
1000 s: (145.0...157.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 50.0...60.0  
1000 s: (47.0...63.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (-)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 73.0...75.0  
1000 s: (70.5...77.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...120.0  
1000 s: (86.0...124.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.00...5.60  
Del.quantity cm<sup>3</sup>/ : 20.0...25.0  
1000 s: (17.5...27.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 h2  
Edition : 18.02.91  
Replaces : 7.1.91  
Test oil : ISO-4113

Combination no. : 0 402 746 896

Injection pump  
Pump designation : PES6P120A720RS7200  
EP type number : 0 412 726 833  
Governor  
Governor design. : RQV325...900PA944-11  
K  
Governor no. : 0 421 815 260

Customer-spec. information  
Customer : MACK TRUCKS

Engine : E7-350

1st version kW : 261.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
x Wall thickness : 6.00X2.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

F01

Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85  
(2.70...2.90)  
Rack travel in mm : 11.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Phasing :  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.50...14.60

Del.quantity cm<sup>3</sup>/ : 27.7...27.9  
100 s: (27.4...28.2)

Spread cm<sup>3</sup> : 0.5  
100 s: (0.9)

2nd speed rpm : 340.0  
Rack travel in mm : 4.6...4.8  
Del.quantity cm<sup>3</sup>/ : 3.1...3.7  
100 s: (2.9...3.9)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.40...1.60  
2nd speed rpm : 450  
travel mm : 2.80...3.20  
3rd speed rpm : 700  
travel mm : 6.00...6.40  
4th speed rpm : 900  
travel mm : 8.50...8.70  
5th speed rpm : 1050  
travel mm : 9.80...10.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900  
Aneroid pressure h: 1200  
Del.quantity : 277.5...279.5  
1000 : (274.5...282.5)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 13.50  
Speed rpm : 940...990  
2nd rack travel in: 4.00  
Speed rpm : 1115...1125  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 625  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 675  
Rack travel in m: 13.80...14.00  
4th speed rpm : 500  
Rack travel in m: 11.90...12.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.60

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.10...8.50  
2nd pressure hPa : 400  
Rack travel in m: 9.80...9.90  
3rd pressure hPa : 775  
Rack travel in m: 12.60...13.00

## START CUT-OUT

Speed 1/min : 250 (255)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 290.0...296.0  
1000 s: (287.0...299.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 199.0...201.0 \*  
1000 s: (180.5...207.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 150.0...154.0  
1000 s: (148.0...156.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 940...990

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 19.00...21.00

## LOW IDLE

Speed rpm : 340  
Rack travel in mm : 4.60...4.80  
Del.quantity cm<sup>3</sup>/ : 31.0...37.0  
1000 s: (29.0...39.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:  
: MACK # 313GC5188-P12

Bow dimension:  
Sliding-sleeve position = 37.0 mm  
\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 h1  
 Edition : 18.02.91  
 Replaces : 14.12.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 897

Injection pump  
 Pump designation : PES6P120A720RS7200  
 EP type number : 0 412 726 833  
 Governor  
 Governor design. : RQV325...875PA944-12  
 K  
 Governor no. : 0 421 815 261

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM7-300

1st version kW : 224.0  
 Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

---

Rack travel in mm : 14.00...14.10

---

Del. quantity cm<sup>3</sup>/ : 25.0...25.2  
 100 s: (24.7...25.5)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 340.0  
 Rack travel in mm : 4.6...4.8  
 Del. quantity cm<sup>3</sup>/ : 3.1...3.7  
 100 s: (2.9...3.9)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.40...1.60  
 2nd speed rpm : 450  
 travel mm : 3.30...3.70  
 3rd speed rpm : 700  
 travel mm : 7.90...8.30  
 4th speed rpm : 900  
 travel mm : 9.40...9.60  
 5th speed rpm : 1050  
 travel mm : 10.60...11.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del. quantity : 250.0...252.0  
 1000 : (247.0...255.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 61...69

### Testing:

1st rack travel in: 13.00  
Speed rpm : 915...965  
2nd rack travel in: 4.00  
Speed rpm : 1075...1085  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 8...16

### Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.60...4.80

## CONSTANT REGULATION

Speed rpm : 325...520

## TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 510  
Rack travel in m: 14.70...14.90  
3rd speed rpm : 575  
Rack travel in m: 14.70...14.90  
4th speed rpm : 450  
Rack travel in m: 13.90...14.30

## Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 14.70...14.90

### Measurement

Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.70...9.10  
2nd pressure hPa : 370  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 760  
Rack travel in m: 13.30...13.70

## START CUT-OUT

Speed 1/min : 250 (255)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 328.0...334.0  
1000 s: (325.0...337.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 199.0...201.0 \*  
1000 s: (159.5...183.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 156.0...160.0  
1000 s: (154.0...162.0)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 915...965

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...230.0  
1000 s: (180.0...240.0)  
Rack travel in mm : 19.00...21.00

## LOW IDLE

Speed rpm : 340  
Rack travel in mm : 4.60...4.80  
Del.quantity cm<sup>3</sup>/ : 31.0...37.0  
1000 s: (29.0...39.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

### Remarks:

: MACK # 313GC5188-P10

### Bow dimension:

Sliding-sleeve position = 37.0 mm  
\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 9,5 i  
Edition : 27.02.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 901  
  
Injection pump  
Pump designation : PES6P120A720RS7224  
EP type number : 0 412 726 840  
Governor  
Governor design. : RQV275...1100PA975K  
Governor no. : 0 421 815 266

Customer-spec. information  
Customer : IVECO-UNIC

Engine : 8460.41.406

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 9.00...12.00

F07

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.1...5.5

Del.quantity cm3/ : 3.2...3.8

100 s: (2.9...4.1)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1145

travel mm : 10.30...10.50

2nd speed rpm : 275

travel mm : 1.30...1.50

3rd speed rpm : 450

travel mm : 3.40...4.00

4th speed rpm : 750

travel mm : 5.90...6.30

5th speed rpm : 1350

travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 234.0...236.0

1000 : (231.0...239.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.80  
Speed rpm : 275  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION  
Speed rpm : 270...400

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 900  
Rack travel in m: 12.30...12.60  
3rd speed rpm : 700  
Rack travel in m: 11.70...11.90  
4th speed rpm : 500  
Rack travel in m: 11.20...11.50  
5th speed rpm : 350  
Rack travel in m: 10.80...11.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 850  
Pressure hPa : 1200  
Rack travel mm : 12.40...12.50

Measurement  
Speed 1/min : 850

1st pressure hPa : -  
Rack travel in m: 7.50...7.70  
2nd pressure hPa : 710

F08

Rack travel in m: 11.20...11.30  
3rd pressure hPa : 400  
Rack travel in m: 8.60...9.00

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 242.0...248.0  
1000 s: (239.0...251.0)  
Aneroid pressure h: 1200  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 246.0...252.0  
1000 s: (243.0...255.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 119.0...121.0  
1000 s: (116.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...190.0  
1000 s: (156.0...194.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.10...5.50  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (29.0...41.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 9,5 i 1  
 Edition : 01.03.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 902  
 Injection pump  
 Pump designation : PES6P120A720RS7224  
 EP type number : 0 412 726 840  
 Governor  
 Governor design. : RQV275...1100PA975-1  
 K  
 Governor no. : 0 421 815 267  
 Customer spec. information  
 Customer : IVECO-UNIC  
 Engine : 8460.41.320

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.20...5.30  
 : (5.15...5.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 11.20...11.30  
 Del.quantity cm<sup>3</sup>/ : 20.9...21.1  
 100 s: (20.6...21.4)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 275.0  
 Rack travel in mm : 5.1...5.5  
 Del.quantity cm<sup>3</sup>/ : 3.2...3.8  
 100 s: (2.9...4.1)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1145  
 travel mm : 10.30...10.50  
 2nd speed rpm : 275  
 travel mm : 1.30...1.50  
 3rd speed rpm : 450  
 travel mm : 3.40...4.00  
 4th speed rpm : 750  
 travel mm : 5.90...6.30  
 5th speed rpm : 1350  
 travel mm : 13.00...14.00

### GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1140  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200  
 Del.quantity : 209.0...211.0  
 1000 : (206.0...214.0)



Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

#### Testing:

1st rack travel in: 10.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 64...72

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.80  
Speed rpm : 275  
Rack travel in mm : 5.20...5.40

#### CONSTANT REGULATION

Speed rpm : 270...400

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 900  
Rack travel in m: 10.70...10.90  
3rd speed rpm : 700  
Rack travel in m: 9.90...10.10  
4th speed rpm : 400  
Rack travel in m: 9.30...9.70

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 11.20...11.30

#### Measurement

Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 7.70...7.90  
2nd pressure hPa : 600  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 420

F10

Rack travel in m: 9.10...9.50

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 188.0...194.0  
1000 s: (185.0...197.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 120.0...122.0  
1000 s: (117.0...125.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 1140...1150

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.10...5.50  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (29.0...41.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 9,5 i 2  
 Edition : 01.03.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 903  
 Injection pump  
 Pump designation : PES6P120A720RS7224  
 EP type number : 0 412 726 840  
 Governor  
 Governor design. : RQV275...1100PA888-1  
 K  
 Governor no. : 0 421 815 268  
 Customer-spec. information  
 Customer : IVECO-UNIC  
 Engine : 8460.41.160

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 668 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.20...5.30  
 : (5.15...5.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850  
 Rack travel in mm : 11.80...11.90  
 Del.quantity cm3/ : 22.4...22.6  
 100 s: (22.1...22.9)  
 Spread cm3 : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 275.0  
 Rack travel in mm : 5.2...5.6  
 Del.quantity cm3/ : 3.0...3.6  
 100 s: (2.7...3.9)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1145  
 travel mm : 10.10...10.30  
 2nd speed rpm : 275  
 travel mm : 1.10...1.30  
 3rd speed rpm : 400  
 travel mm : 2.50...3.10  
 4th speed rpm : 750  
 travel mm : 5.50...5.90  
 5th speed rpm : 1350  
 travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1150  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 900  
 Del.quantity : 224.0...226.0  
 1000 : (221.0...229.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 10.60  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 66...74

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.90  
Speed rpm : 275  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 270...400

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 11.80...11.90  
2nd speed rpm : 1100  
Rack travel in m: 11.60...11.80  
3rd speed rpm : 700  
Rack travel in m: 11.20...11.40  
4th speed rpm : 400  
Rack travel in m: 10.70...11.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 850  
Pressure hPa : 900  
Rack travel mm : 11.80...11.90

Measurement  
Speed 1/min : 850

1st pressure hPa : -  
Rack travel in m: 8.10...8.30  
2nd pressure hPa : 640  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 400

F12

Rack travel in m: 8.90...9.20

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm3/ : 210.0...216.0  
1000 s: (207.0...219.0)  
Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 220.0...226.0  
1000 s: (217.0...229.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 127.0...129.0  
1000 s: (124.0...132.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.60  
Speed rpm : 1140...1150

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.20...5.60  
Del.quantity cm3/ : 30.0...36.0  
1000 s: (27.0...39.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 c 3  
 Edition : 18.02.91  
 Replaces : 19.3.90  
 Test oil : ISO-4113

Combination no. : 0 402 776 806

Injection pump  
 Pump designation : PES6P120A720LS7120  
 EP type number : 0 412 726 803  
 Governor  
 Governor design. : RSV350...1050POA529  
 -3  
 Governor no. : 0 421 833 317

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM447 A

1st version kW : 213.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 650

Rack travel in mm : 14.00...14.20

Del.quantity cm<sup>3</sup>/ : 20.2...20.4

100 s: (19.9...20.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650

Aneroid pressure h: 650

Del.quantity : 202.0...204.0

1000 : (199.0...207.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 48...56

### Testing:

1st rack travel in: 12.30  
Speed rpm : 1080...1085  
2nd rack travel in: 4.00  
Speed rpm : 1160...1173  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

### LOW IDLE 1

Control lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.7  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 13.30...13.50  
2nd speed rpm : 950  
Rack travel in m: 13.70...13.90  
3rd speed rpm : 875  
Rack travel in m: 14.20...14.40  
4th speed rpm : 750  
Rack travel in m: 14.70...14.90

Aneroid/Altitude  
Compensator Test

### 1st version

#### Setting

Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.00...14.20

#### Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 400  
Rack travel in m: 13.20...13.40  
3rd pressure hPa : 850  
Rack travel in m: 14.30...14.50  
4th pressure hPa : -  
Rack travel in m: 11.30...11.60

### FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1030

Del.quantity cm3/ : 194.0...197.0  
1000 s: (191.0...200.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 219.0...224.0  
1000 s: (216.0...227.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 144.0...146.0  
1000 s: (141.0...149.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

### BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 12.30

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...210.0  
1000 s: (186.0...214.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 c 4  
 Edition : 18.02.91  
 Replaces : 17.9.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 776 807  
 Injection pump  
 Pump designation : PES6P120A720LS7120-2  
 EP type number : 0 412 726 832  
 Governor  
 Governor design. : RSV350...1050POA529  
 -3  
 Governor no. : 0 421 833 332

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM447 A

1st version kW : 213.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness : 6.00x1.50x1000  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 650

Rack travel in mm : 14.00...14.20

Del.quantity cm<sup>3</sup>/ : 20.2...20.4  
 100 s: (19.9...20.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.6...5.8  
 Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650  
 Aneroid pressure h: 650  
 Del.quantity : 202.0...204.0  
 1000 : (199.0...207.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version

Control Lever  
position degrees: 94...106

Testing:

1st rack travel in: 12.40  
Speed rpm : 1080...1085  
2nd rack travel in: 4.00  
Speed rpm : 1160...1173  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.7  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.40...13.60  
2nd speed rpm : 950  
Rack travel in m: 14.00...14.20  
3rd speed rpm : 875  
Rack travel in m: 14.50...14.70  
4th speed rpm : 750  
Rack travel in m: 14.90...15.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.00...14.20

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 400  
Rack travel in m: 13.20...13.40  
3rd pressure hPa : 850  
Rack travel in m: 14.30...14.50  
4th pressure hPa : -  
Rack travel in m: 11.30...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

F16

Aneroid pressure h: 1200  
Speed rpm : 1030  
Del.quantity cm3/ : 194.0...197.0  
1000 s: (191.0...200.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 219.0...224.0  
1000 s: (216.0...227.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 144.0...146.0  
1000 s: (141.0...149.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.40

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...210.0  
1000 s: (186.0...214.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 H 1  
 Edition : 18.02.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 444 120  
 Injection pump  
 Pump designation : PES4MW100/720RS1151  
 EP type number : 0 413 404 104  
 Governor  
 Governor design. : RQ300/1300MW105-2  
 Governor no. : 0 420 082 051

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM364A

1st version kW : 87.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 9.8...10.0

100 s: (9.6...10.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1400

travel mm : 7.30...7.70

2nd speed rpm : 1300

travel mm : 6.10...6.30

3rd speed rpm : 550

travel mm : 5.70...6.30

4th speed rpm : 300

travel mm : 2.10...2.50

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 107

Speed rpm : 800

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 98.0...100.0

1000 : (96.0...102.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 91...99

Setting point:  
Speed rpm : 800  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1345...1360  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 600  
Rack travel in m: 12.80...12.90  
3rd speed rpm : 1100  
Rack travel in m: 12.40...12.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.30...11.40

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.70...11.80  
2nd pressure hPa : 300  
Rack travel in m: 12.30...12.60  
3rd pressure hPa : 700  
Rack travel in m: 12.80...12.90

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 87.0...90.0  
1000 s: (84.5...92.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 59.0...61.0  
1000 s: (57.0...63.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1345...1360

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...100.0  
1000 s: (87.0...103.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 I  
Edition : 18.02.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 444 121  
Injection pump  
Pump designation : PES4MM100/720RS1212  
EP type number : 0 413 404 114  
Governor  
Governor design. : RGV300...1300MW50-15  
Governor no. : 0 420 083 238

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364LA

1st version kW : 102.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.20...13.30

Del.quantity cm<sup>3</sup>/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.50...9.90

2nd speed rpm : 1340

travel mm : 8.50...8.70

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.30...1.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1340

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 107...115

Testing:  
1st rack travel in: 12.20  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1445...1475  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 320...550

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.20

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 400  
Rack travel in m: 12.60...12.80  
3rd pressure hPa : 700  
Rack travel in m: 13.20...13.30

START CUT-OUT

Speed i/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 86.0...89.0  
1000 s: (83.5...91.5)

Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 36.0...38.0  
1000 s: (34.0...40.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 85.0...95.0  
1000 s: (82.0...98.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 H  
Edition : 18.02.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 444 122  
Injection pump  
Pump designation : PES4MW100/720RS1151  
EP type number : 0 413 404 104  
Governor  
Governor design. : RQV300...1200MW50-14  
Governor no. : 0 420 083 239

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364A

1st version kW : 77.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.50...8.90

2nd speed rpm : 1250

travel mm : 7.60...7.80

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1250

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 86.0...88.0

1000 : (84.0...90.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 105...113

Testing:  
1st rack travel in: 9.80  
Speed rpm : 1250...1260  
2nd rack travel in: 4.00  
Speed rpm : 1350...1380  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 75...83  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50

TORQUE CONTROL  
Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 600  
Rack travel in m: 11.50...11.60  
3rd speed rpm : 1100  
Rack travel in m: 11.00...11.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.50...9.60

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 450  
Rack travel in m: 11.20...11.40  
3rd pressure hPa : 700  
Rack travel in m: 11.50...11.60

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

F22

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 79.0...82.0  
1000 s: (76.5...84.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 46.0...48.0  
1000 s: (44.0...50.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 1250...1260

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 H 3  
Edition : 18.02.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 444 123  
Injection pump  
Pump designation : PES4MM100/720RS1151  
EP type number : 0 413 404 104  
Governor  
Governor design. : RQV300...1300MW50-16  
Governor no. : 0 420 083 240

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364A

1st version kW : 79.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 8.2...8.4

100 s: (8.0...8.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.40...8.80

2nd speed rpm : 880

travel mm : 4.90...5.10

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 82.0...84.0

1000 : (80.0...86.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:

1st rack travel in: 9.80  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 480...540

TORQUE CONTROL

Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 600  
Rack travel in m: 11.90...12.00  
3rd speed rpm : 1000  
Rack travel in m: 11.90...12.00  
4th speed rpm : 1175  
Rack travel in m: 11.30...11.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.10

Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 300  
Rack travel in m: 11.20...11.40  
3rd pressure hPa : 700  
Rack travel in m: 11.90...12.00

START CUT-OUT

F24

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 75.0...78.0  
1000 s: (72.5...80.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 46.0...48.0  
1000 s: (44.0...50.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 H 4  
Edition : 18.02.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 444 124  
  
Injection pump  
Pump designation : PES4MW100/720RS1151  
EP type number : 0 413 404 104  
Governor  
Governor design. : RQ300/1300MW105-4  
Governor no. : 0 420 082 052

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364A

1st version kW : 79.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 8.2...8.4

100 s: (8.0...8.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1400

travel mm : 7.30...7.70

2nd speed rpm : 1300

travel mm : 6.10...6.30

3rd speed rpm : 425

travel mm : 4.80...5.40

4th speed rpm : 300

travel mm : 2.10...2.50

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 107

Speed rpm : 1000

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 82.0...84.0

1000 : (80.0...86.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 89...97

Setting point:  
Speed rpm : 1000  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 9.80  
Speed rpm : 1340...1355  
2nd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 390...450

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 600  
Rack travel in m: 11.90...12.00  
3rd speed rpm : 1000  
Rack travel in m: 11.90...12.00  
4th speed rpm : 1175  
Rack travel in m: 11.30...11.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.10

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 300  
Rack travel in m: 11.20...11.40  
3rd pressure hPa : 700

F26

Rack travel in m: 11.90...12.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 75.0...78.0  
1000 s: (72.5...80.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 46.0...48.0  
1000 s: (44.0...50.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
  
full load rack tr: 9.80  
Speed rpm : 1340...1355

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 H 5  
 Edition : 18.02.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 444 125  
 Injection pump  
 Pump designation : PES4MW100/720RS1151  
 EP type number : 0 413 404 104  
 Governor  
 Governor design. : RQV300...1300MW67-3  
 Governor no. : 0 420 083 242

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 364 LA

1st version kW : 102.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 9.8...10.0

100 s: (9.6...10.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.8...6.9

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.40...8.80

2nd speed rpm : 880

travel mm : 4.90...5.10

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1340

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 98.0...100.0

1000 : (96.0...102.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:

1st rack travel in: 11.60  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1445...1475  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 83...91  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.8

Testing:

Speed rpm : 200  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.80...6.90

CONSTANT REGULATION

Speed rpm : 320...550

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 200  
Rack travel mm : 11.30...11.40

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.50...10.60  
2nd pressure hPa : 335  
Rack travel in m: 12.10...12.40  
3rd pressure hPa : 700  
Rack travel in m: 12.60...12.70

START CUT-OUT

Speed 1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 82.5...85.5  
1000 s: (80.0...88.5)

Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 700  
Speed rpm : 1300  
Del.quantity cm<sup>3</sup>/ : 66.0...68.0  
1000 s: (64.0...70.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 49.0...51.0  
1000 s: (47.0...53.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.60  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 85.0...95.0  
1000 s: (82.0...98.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...6.90  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 71  
 Edition : 01.03.91  
 Replaces : 16.11.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 226  
 Injection pump  
 Pump designation : PES6MW100/720RS1131-1  
 EP type number : 0 413 406 165  
 Governor  
 Governor design. : RQ300/1300MW105  
 Governor no. : 0 420 082 039

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366LA

1st version kW : 177.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)

GO1

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.40...14.50

Del.quantity cm3/ : 11.4...11.6  
 100 s: (11.2...11.8)

Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm3/ : 1.0...1.4  
 100 s: (0.7...1.6)  
 Spread cm3 : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
 travel mm : 9.40...9.80  
 2nd speed rpm : 1360  
 travel mm : 7.20...7.40  
 3rd speed rpm : 550  
 travel mm : 4.20...4.80  
 4th speed rpm : 300  
 travel mm : 1.30...1.70

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: 107  
 Speed rpm : 1000  
 Rack travel in mm : 14.70...16.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 1000  
 Del.quantity : 114.0...116.0  
 1000 : (112.0...118.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 101...109

Setting point:  
Speed rpm : 1000  
Rack travel in mm : 15.5

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1345...1360  
2nd rack travel in: 4.00  
Speed rpm : 1450...1480  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.60...10.70

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 500  
Rack travel in m: 13.50...13.70  
3rd pressure hPa : 1000  
Rack travel in m: 14.40...14.50

#### START CUT-OUT

Speed 1/min : 180 (200)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750

Del.quantity cm3/ : 106.5...109.5  
1000 s: (104.0...112.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 41.0...43.0  
1000 s: (39.0...45.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1345...1360

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 8,8 S 3  
 Edition : 18.02.91  
 Replaces : 02.05.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 235  
 Injection pump  
 Pump designation : PES6MW100/320RS1171  
 EP type number : 0 413 406 156  
 Governor  
 Governor design. : RQV300...1300MW80-5  
 Governor no. : 0 420 083 197

Customer spec. information  
 Customer : RVI

Engine : MIDS 060212B

1st version kW : 113.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 033

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.80...10.90

Del. quantity cm<sup>3</sup>/ : 8.8...9.0

100 s: (8.6...9.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.40...5.80

Del. quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1500

travel mm : 8.70...9.10

2nd speed rpm : 1350

travel mm : 7.60...7.80

3rd speed rpm : 500

travel mm : 2.80...3.40

4th speed rpm : 300

travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del. quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 60...68

Testing:

1st rack travel in: 9.80  
Speed rpm : 1390...1400  
2nd rack travel in: 4.00  
Speed rpm : 1505...1535  
4th rack travel in: 1700  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 10...18  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 300  
Rack travel in mm : 5.40...5.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.70...8.80

Measurement

Speed 1/min : 500

1st pressure hPa : 100  
Rack travel in m: 9.30...9.40  
2nd pressure hPa : 200  
Rack travel in m: 10.20...10.50  
3rd pressure hPa : 700  
Rack travel in m: 10.80...10.90

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 900  
Del.quantity cm3/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 44.0...46.0  
1000 s: (42.0...48.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1390...1400

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (87.0...113.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.40...5.80  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark made with  
prestroke 3.00...3.10 mm at barrel 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 6,1 V  
Edition : 18.02.91  
Replaces : 14.09.90  
Test oil : ISO-4113  
  
Combination no. : 0 403 446 247  
  
Injection pump  
Pump designation : PES6MW100/720RS1195  
EP type number : 0 413 406 183  
Governor  
Governor design. : RQV300...1150MW107  
Governor no. : 0 420 083 208

Customer-spec. information  
Customer : KHD

Engine : BF 6L 913 C

1st version kW : 101.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
: (3.95...4.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.70...9.80

Del.quantity cm<sup>3</sup>/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 315.0

Rack travel in mm : 7.5...7.7

Del.quantity cm<sup>3</sup>/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1200

travel mm : 9.80...10.20

2nd speed rpm : 800

travel mm : 5.90...6.10

3rd speed rpm : 450

travel mm : 3.00...3.60

4th speed rpm : 300

travel mm : 1.60...2.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1220

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 1000

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)



## RATED SPEED

1st version  
Control lever  
position degrees: 40...48

Testing:  
1st rack travel in: 8.70  
Speed rpm : 1180...1190  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 7.6

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 315  
Rack travel in mm : 7.50...7.70  
Rack travel in mm : 2.00  
Speed rpm : 420...480

TORQUE CONTROL  
Dimension a mm : 0.75  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 9.70...9.80  
2nd speed rpm : 800  
Rack travel in m: 10.30...10.50  
3rd speed rpm : 1030  
Rack travel in m: 10.00...10.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.20

Measurement  
Speed 1/min : 500  
2nd pressure hPa : 450  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 1000  
Rack travel in m: 10.30...10.50

## START CUT-OUT

Speed 1/min : 230 (250)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 69.0...71.0  
1000 s: (67.0...73.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.70  
Speed rpm : 1180...1190

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 110.0...130.0  
1000 s: (107.0...133.0)

## LOW IDLE

Speed rpm : 315  
Rack travel in mm : 7.50...7.70  
Del.quantity cm3/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

Test electrically-released starting  
quantity (EES) with 12 volts

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 65  
Edition : 01.03.91  
Replaces : 16.11.90  
Test oil : ISO-4113  
  
Combination no. : 0 403 446 259  
  
Injection pump  
Pump designation : PES6MW100/720RS1131-1  
EP type number : 0 413 406 165  
Governor  
Governor design. : RQV300...1300MW68-2  
Governor no. : 0 420 083 224

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 177.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
: (3.55...3.75)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300  
Rack travel in mm : 14.40...14.50  
Del.quantity cm<sup>3</sup>/ : 11.4...11.6  
100 s: (11.2...11.8)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 6.3...6.5  
Del.quantity cm<sup>3</sup>/ : 1.0...1.4  
100 s: (0.7...1.6)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

GUIDE SLEEVE TRAVEL  
1st speed rpm : 1450  
travel mm : 9.40...9.80  
2nd speed rpm : 1350  
travel mm : 8.40...8.60  
3rd speed rpm : 600  
travel mm : 3.90...4.50  
4th speed rpm : 300  
travel mm : 0.80...1.20

GUIDE SLEEVE POSITION  
Control-lever position  
Degree: -1  
Speed rpm : 1350  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1300  
Aneroid pressure h: 1000  
Del.quantity : 114.0...116.0  
1000 : (112.0...118.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1480...1510  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.60...10.70

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.50...11.70  
2nd pressure hPa : 400  
Rack travel in m: 13.30...13.50  
3rd pressure hPa : 1000  
Rack travel in m: 14.40...14.50

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 106.5...109.5  
1000 s: (104.0...112.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 41.0...43.0  
1000 s: (39.0...45.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,1 A  
 Edition : 18.02.91  
 Replaces : 05.11.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 271  
 Injection pump  
 Pump designation : PES6MW100/720RS1144  
 EP type number : 0 413 406 138  
 Governor  
 Governor design. : RQV300...1300MW50-11  
 Governor no. : 0 420 083 235

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 129.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 11.40...11.50  
 Del.quantity cm3/ : 7.8...8.0  
 100 s: (7.6...8.2)

Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 8.4...8.6  
 Del.quantity cm3/ : 0.9...1.3  
 100 s: (0.6...1.5)  
 Spread cm3 : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
 travel mm : 9.10...9.50  
 2nd speed rpm : 1345  
 travel mm : 8.20...8.40  
 3rd speed rpm : 500  
 travel mm : 3.80...4.40  
 4th speed rpm : 300  
 travel mm : 1.10...1.50

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1350  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 900  
 Del.quantity : 78.0...80.0  
 1000 : (76.0...82.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 10.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 81...89  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 8.5  
Minimum rack travel: 10.00  
Speed rpm : 300  
Rack travel in mm : 8.40...8.60

CONSTANT REGULATION  
Speed rpm : 330...500

TORQUE CONTROL  
Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 600  
Rack travel in m: 12.20...12.30  
3rd speed rpm : 900  
Rack travel in m: 11.80...12.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.50...10.60

Measurement  
Speed 1/min : 500

1st pressure hPa : 225  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 325  
Rack travel in m: 11.90...12.10  
3rd pressure hPa : 900  
Rack travel in m: 12.20...12.30

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

G10

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm3/ : 67.0...70.0  
1000 s: (64.5...72.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 37.0...39.0  
1000 s: (35.0...41.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.40  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 8.40...8.60  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,1 B 1  
 Edition : 16.01.91  
 Replaces : 23.11.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 272  
 Injection pump  
 Pump designation : PES6MW100/720RS1131-1  
 EP type number : 0 413 406 165  
 Governor  
 Governor design. : RQ300/1300MW105-1  
 Governor no. : 0 420 082 048

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366LA

1st version kW : 155.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.10...13.20

Del.quantity cm3/ : 9.8...10.0

100 s: (9.6...10.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.50...9.90

2nd speed rpm : 1360

travel mm : 7.30...7.50

3rd speed rpm : 550

travel mm : 4.20...4.80

4th speed rpm : 300

travel mm : 1.30...1.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 102

Speed rpm : 1200

Rack travel in mm : 14.70...16.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 98.0...100.0

1000 : (96.0...102.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 99...107

Setting point:  
Speed rpm : 1200  
Rack travel in mm : 15.5

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1345...1360  
2nd rack travel in: 4.00  
Speed rpm : 1435...1465  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.40

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 350  
Rack travel in m: 12.40...12.70  
3rd pressure hPa : 1000  
Rack travel in m: 13.10...13.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750

Del.quantity cm<sup>3</sup>/ : 87.0...91.0  
1000 s: (85.0...93.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 36.0...38.0  
1000 s: (34.0...40.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1345...1360

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,1 D 2  
 Edition : 18.02.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 276  
 Injection pump  
 Pump designation : PES6MM100/720RS1131  
 EP type number : 0 413 406 123  
 Governor  
 Governor design. : RQV300...1200MW50-18  
 Governor no. : 0 420 083 243

Customer spec. information  
 Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 115.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 715 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.75)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.20...10.30

Del.quantity cm3/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 7.40...7.80

2nd speed rpm : 880

travel mm : 4.90...5.10

3rd speed rpm : 500

travel mm : 2.70...3.10

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1250

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 105...113

Testing:  
1st rack travel in: 9.20  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1335...1365  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 73...81  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.7

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 410...470

TORQUE CONTROL  
Dimension a mm : 0.90  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 600  
Rack travel in m: 11.10...11.20  
3rd speed rpm : 1100  
Rack travel in m: 10.30...10.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 200  
Rack travel mm : 8.90...9.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.60...8.70  
2nd pressure hPa : 350  
Rack travel in m: 10.20...10.50  
3rd pressure hPa : 700  
Rack travel in m: 11.10...11.20

START CUT-OUT

Speed 1/min : 200 (230)

G14

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 78.0...81.0  
1000 s: (75.5...83.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 44.0...46.0  
1000 s: (42.0...48.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.20  
Speed rpm : 1240...1250

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

## LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 6,1 N 8  
 Edition : 18.02.91  
 Replaces : 12.08.88  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 277  
 Injection pump  
 Pump designation : PES6MW100/720RS1133  
 EP type number : 0 413 406 126  
 Governor  
 Governor design. : RQV300...1325MW114  
 Governor no. : 0 420 083 241

Customer-spec. information  
 Customer : KHD

Engine : BF 6L 913

1st version kW : 124.0  
 Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1325

Rack travel in mm : 10.50...10.60

Del.quantity cm3/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.8...6.9

Del.quantity cm3/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1375

travel mm : 10.00...10.40

2nd speed rpm : 975

travel mm : 6.50...6.70

3rd speed rpm : 575

travel mm : 3.10...3.70

4th speed rpm : 300

travel mm : 0.50...0.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1225

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1325

Aneroid pressure h: 900

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 109...117

Testing:  
1st rack travel in: 9.50  
Speed rpm : 1365...1375  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.10...1.00

LOW IDLE 1  
Control lever  
position degrees: 75...83  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.8

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.80...6.90  
Rack travel in mm : 2.00  
Speed rpm : 430...490

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 450  
Rack travel mm : 9.90...10.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.00  
2nd pressure hPa : 350  
Rack travel in m: 9.30...9.60  
3rd pressure hPa : 900  
Rack travel in m: 10.50...10.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 800  
Del.quantity cm3/ : 93.0...97.0  
1000 s: (91.0...99.0)

Spread cm3 : 3.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 57.0...59.0  
1000 s: (55.0...61.0)

RACK STOP ADJUSTMENT

Speed rpm : 100

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1365...1375

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...6.90  
Del.quantity cm3/ : 11.0...15.0  
1000 s: (9.0...17.0)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,2 V 1  
 Edition : 18.02.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 456 114  
 Injection pump  
 Pump designation : PES6M100/321RS1201  
 EP type number : 0 413 406 190  
 Governor  
 Governor design. : RQV250...1200MW83-2  
 Governor no. : 0 420 083 216

Customer spec. information  
 Customer : MAN

Engine : D 0826 LF02

1st version kW : 169.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 13.7...13.9

100 s: (13.5...14.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 10.50...10.60

2nd speed rpm : 810

travel mm : 5.90...6.10

3rd speed rpm : 500

travel mm : 3.70...4.30

4th speed rpm : 250

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1225

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 137.0...139.0

1000 : (135.0...141.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control Lever  
position degrees: 120...128

Testing:  
1st rack travel in: 11.50  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 77...85  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 330...420

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 170  
Rack travel mm : 10.00...10.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 550  
Rack travel in m: 11.90...12.20  
3rd pressure hPa : 1000  
Rack travel in m: 12.50...12.60

## START CUT-OUT

Speed 1/min : 170 (200)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 600

Del.quantity cm3/ : 135.0...138.0  
1000 s: (132.5...140.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 138.0...141.0  
1000 s: (135.5...143.5)  
Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm3/ : 136.0...139.0  
1000 s: (133.5...141.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.50  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: MAN #3-7135

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 J  
 Edition : 18.02.91  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 474 013

Injection pump  
 Pump designation : PES4MW100/720RS1127  
 EP type number : 0 413 404 103  
 Governor  
 Governor design. : RSV750...1250MWA318  
 -8  
 Governor no. : 0 420 085 167

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 364 A

1st version kW : 84.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1230

Rack travel in mm : 12.40...12.50

Del.quantity cm<sup>3</sup>/ : 8.4...8.6  
 100 s: (8.2...8.8)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 750.0  
 Rack travel in mm : 6.7...7.3  
 Del.quantity cm<sup>3</sup>/ : 0.9...1.3  
 100 s: (0.6...1.5)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 2.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1230  
 Del.quantity : 84.0...86.0  
 1000 : (82.0...88.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (4.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 88...96

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
 1st rack travel in: 11.40

Speed rpm : 1270...1280  
2nd rack travel in: 4.00  
Speed rpm : 1295...1315  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 750  
Rack travel in mm : 7.0

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 750  
Rack travel in mm : 6.70...7.30  
Rack travel in mm : 2.00  
Speed rpm : 750...810

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750

#### RACK STOP ADJUSTMENT

Speed rpm : 100

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1270...1280

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 83.0...93.0  
1000 s: (80.0...96.0)

#### LOW IDLE

Speed rpm : 750  
Rack travel in mm : 6.70...7.30  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

G20

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 8,4 D  
Edition : 18.02.91  
Replaces : 17.09.90  
Test oil : ISO-4113  
  
Combination no. : 0 403 476 081  
  
Injection pump  
Pump designation : PES6MW100/720RS1196  
EP type number : 0 413 406 184  
Governor  
Governor design. : RSV350...1050MWOA338  
Governor no. : 0 420 085 138

Customer-spec. information  
Customer : LIEBHERR

Engine : D 916 T

1st version kW : 170.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.40...3.50  
: (3.35...3.55)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 425.0

Rack travel in mm : 4.8...5.2

Del.quantity cm<sup>3</sup>/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 750

Del.quantity : 133.0...135.0

1000 : (131.0...137.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 98...106

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.10



Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
4th rack travel in: 1200  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 4.80...5.20

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 550  
Pressure hPa : -  
Rack travel mm : 10.70...10.80

Measurement  
Speed 1/min : 550

1st pressure hPa : 200  
Rack travel in m: 10.90...11.00  
2nd pressure hPa : 750  
Rack travel in m: 11.10...11.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 750  
Speed rpm : 500  
Del.quantity cm3/ : 125.0...128.0  
1000 s: (122.5...130.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 750  
Speed rpm : 800  
Del.quantity cm3/ : 132.0...135.0  
1000 s: (129.5...137.5)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 120.0...122.0  
1000 s: (118.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1070...1080

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 4.80...5.20  
Del.quantity cm3/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,1 C  
 Edition : 18.02.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 098  
 Injection pump  
 Pump designation : PES6MW100/720RS1130  
 EP type number : 0 413 406 122  
 Governor  
 Governor design. : RSV350...1075MW0A318  
 -7  
 Governor no. : 0 420 085 158

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 111.0  
 Rated speed : 2150

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1060

Rack travel in mm : 11.20...11.30

Del.quantity cm<sup>3</sup>/ : 7.4...7.6

100 s: (7.2...7.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 7.4...7.6

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1060

Del.quantity : 74.0...76.0

1000 : (72.0...78.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.20

Speed rpm : 1100...1110  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 7.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 7.40...7.60  
Rack travel in mm : 2.00  
Speed rpm : 450...510

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Dimension a mm : 0.60  
Torque control curve - 1st version  
1st speed rpm : 1060  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 600  
Rack travel in m: 11.80...11.90  
3rd speed rpm : 900  
Rack travel in m: 11.40...11.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm3/ : 61.5...64.5  
1000 s: (59.0...67.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.20  
Speed rpm : 1100...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.40...7.60  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER 6,1 R  
Edition : 18.02.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 476 102  
  
Injection pump  
Pump designation : PES6MW100/320RS1211  
EP type number : 0 413 406 202  
Governor  
Governor design. : RSV650...750MW4A311-5  
Governor no. : 0 420 085 166

Customer-spec. information  
Customer : PENTA

Engine : TID 61 AG

1st version kW : 115.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.90...3.00  
: (2.85...3.05)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.20...11.30

Del.quantity cm<sup>3</sup>/ : 12.4...12.6

100 s: (12.2...12.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 650.0  
Rack travel in mm : 6.0...6.5  
Del.quantity cm<sup>3</sup>/ : 1.7...2.1  
100 s: (1.5...2.2)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3

Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 6.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Del.quantity : 124.0...126.0  
1000 : (122.0...128.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 99...107

Setting point:  
Speed rpm : 800  
Rack travel in mm : 0.6

Testing:  
1st rack travel in: 10.20

Speed rpm : 748...753  
2nd rack travel in: 4.00  
Speed rpm : 773...788  
4th rack travel in: 1000  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control Lever  
position degrees: 91...99  
Setting point w/out bumper spring  
Speed rpm : 650  
Rack travel in mm : 5.2

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 650  
Rack travel in mm : 5.00...5.50  
Rack travel in mm : 2.00  
Speed rpm : 670...730

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 748...753

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (137.0...163.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 650  
Rack travel in mm : 6.00...6.50  
Del.quantity cm3/ : 17.0...21.0  
1000 s: (15.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MMM 3,4 b  
 Edition : 05.03.91  
 Replaces : 24.11.89  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 426  
 Injection pump  
 Pump designation : PES4A80D320/3RS1265  
 EP type number : 9 400 083 055  
 Governor  
 Governor design. : RSV350...1200A2B627R  
 Governor no. : 9 420 082 194

Customer-spec. information  
 Customer : MMM

Engine : D225-4

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 012

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 9.40...9.50

Del.quantity cm3/ : 5.0...5.1

100 s: (4.9...5.3)

Spread cm3 : 0.2

100 s: (0.4)

2nd speed rpm : 350.0

Rack travel in mm : 6.9...7.1

Del.quantity cm3/ : 0.7...1.1

100 s: (0.5...1.3)

Spread cm3 : 0.2

100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1200

Del.quantity : 50.5...51.5

1000 : (49.0...53.0)

Spread cm3 : 2.50

1000 : (4.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 46...54

Testing:

1st rack travel in: 8.40

Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1285...1315  
4th rack travel in: 1400  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control Lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 490...550

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 9.40...9.50  
2nd speed rpm : 500  
Rack travel in m: 9.40...9.60  
5th speed rpm : 400  
Rack travel in m: 10.60...11.20

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.40  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10

Remarks:  
:

#### APPLICATION

Navy

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 3,4 b 1  
 Edition : 05.03.91  
 Replaces : 24.11.89  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 427  
 Injection pump  
 Pump designation : PES4A80D320/3RS1265  
 EP type number : 9 400 083 055  
 Governor  
 Governor design. : RSV350...900A7B627R  
 Governor no. : 9 420 082 193

Customer-spec. information  
 Customer : MWM

Engine : D225-4

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.20...10.30

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.4)

Spread cm3 : 0.2

100 s: (0.4)

2nd speed rpm : 350.0

Rack travel in mm : 6.9...7.1

Del.quantity cm3/ : 0.6...1.0

100 s: (0.4...1.2)

Spread cm3 : 0.2

100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 900

Del.quantity : 51.5...52.5

1000 : (50.0...54.0)

Spread cm3 : 2.50

1000 : (4.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...58

Testing:

1st rack travel in: 9.20



Speed rpm : 940...945  
2nd rack travel in: 4.00  
Speed rpm : 975...980  
4th rack travel in: 1100  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 420...480

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 500  
Rack travel in m: 10.20...10.40  
5th speed rpm : 400  
Rack travel in m: 11.40...12.00

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 940...945

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10

Remarks:

:

#### APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MMM 5,1 a  
 Edition : 05.03.91  
 Replaces : 26.3.90  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 429  
 Injection pump  
 Pump designation : PES6A80D320/3RS1261  
 EP type number : 9 400 083 057  
 Governor  
 Governor design. : RSV350...900A7B627R  
 Governor no. : 9 420 082 193

Customer-spec. information  
 Customer : MMM

Engine : D225-6

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.20...10.30

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.4)

Spread cm3 : 0.2

100 s: (0.4)

2nd speed rpm : 350.0

Rack travel in mm : 6.9...7.1

Del.quantity cm3/ : 0.7...1.1

100 s: (0.5...1.3)

Spread cm3 : 0.2

100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 51.5...52.5

1000 : (50.0...54.0)

Spread cm3 : 2.50

1000 : (4.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...58

Testing:

1st rack travel in: 9.20

Speed rpm : 940...945  
2nd rack travel in: 4.00  
Speed rpm : 975...980  
4th rack travel in: 1100  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 420...480

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 500  
Rack travel in m: 10.20...10.40  
5th speed rpm : 400  
Rack travel in m: 11.40...12.00

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 940...945

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10

Remarks:

:

#### APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FOR 7,8 L  
Edition : 05.03.91  
Replaces : 16.1.91  
Test oil : ISO-4113  
  
Combination no. : 9 400 085 324  
  
Injection pump  
Pump designation : PES6A95D410RS2801  
EP type number : 9 400 084 023  
Governor  
Governor design. : RQV350...1300AB1255L  
Governor no. : 9 420 080 294

Customer-spec. information  
Customer : FNH

Engine : 7.8 L - TC

1st version kW : 158.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.15...3.25  
: (3.10...3.30)  
Rack travel in mm : 9.00...12.00

H05

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
& maximum rack tra: 21.00  
Difference ° CS : 2.00...3.00

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.40...13.50

Del. quantity cm<sup>3</sup>/ : 10.6...10.8  
100 s: (10.3...11.0)

Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)

2nd speed rpm : 350.0  
Rack travel in mm : 6.5...6.7  
Del. quantity cm<sup>3</sup>/ : 1.1...1.7  
100 s: (0.9...1.8)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
travel mm : 8.50...8.60  
2nd speed rpm : 350  
travel mm : 1.10...1.80  
3rd speed rpm : 500  
travel mm : 2.70...3.10  
4th speed rpm : 700  
travel mm : 3.50...3.90  
5th speed rpm : 1000  
travel mm : 4.90...5.30

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1390  
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1300  
Aneroid pressure h: 1000  
Del.quantity : 106.0...108.0  
1000 : (103.5...110.5)  
Spread cm3 : 3.50  
1000 : (6.00)

### RATED SPEED

#### 1st version

Control lever  
position degrees: 111...119

#### Testing:

1st rack travel in: 12.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1485...1515  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

### LOW IDLE 1

Control lever  
position degrees: 66...74

#### Testing:

Speed rpm : 100  
Minimum rack trave: 9.00  
Speed rpm : 350  
Rack travel in mm : 6.50...6.70

### CONSTANT REGULATION

Speed rpm : 350...420

### TORQUE CONTROL

Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 850  
Rack travel in m: 13.80...13.90  
4th speed rpm : 1050  
Rack travel in m: 13.60...13.70

### Aneroid/Altitude

#### Compensator Test

### 1st version

#### Setting

Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.80...13.90

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.80...12.10

H06

2nd pressure hPa : 410

Rack travel in m: 12.20...12.40

3rd pressure hPa : 610

Rack travel in m: 13.00...13.10

### START CUT-OUT

Speed 1/min : 290 (310)

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 850  
Del.quantity cm3/ : 107.0...110.0  
1000 s: (104.5...112.5)  
Speed rpm : 1050  
Del.quantity cm3/ : 106.0...109.0  
1000 s: (103.5...111.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (71.5...78.5)

### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1340...1350

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 155.0...175.0  
1000 s: (152.0...178.0)  
Rack travel in mm : 19.00...21.00

### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 11.0...17.0  
1000 s: (9.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Set shutoff stop 1.5...2.0 mm before shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,8 n  
Edition : 05.03.91  
Replaces : 8.85  
Test oil : ISO-4113  
  
Combination no. : 9 400 087 319  
  
Injection pump  
Pump designation : PE6P110A720RS371  
EP type number : 0 411 816 123  
Governor  
Governor design. : RQV300...1050PA747  
Governor no. : 9 420 080 195

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 355 A

1st version kW : 210.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 004

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 9.00...12.00

H07

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.50...11.60

Del.quantity cm3/ : 16.1...16.3

100 s: (15.9...16.5)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.6...2.1

100 s: (1.4...2.3)

Spread cm3 : 0.3

100 s: (0.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1070

travel mm : 8.50...8.60

2nd speed rpm : 270

travel mm : 0.80...1.20

3rd speed rpm : 450

travel mm : 2.80...3.10

4th speed rpm : 800

travel mm : 5.50...5.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1070

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 161.0...163.0

1000 : (159.0...165.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 99...107

Testing:  
1st rack travel in: 10.50  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 48...56

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.60  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 270...340

#### START CUT-OUT

Speed 1/min : 230 (270)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 152.0...156.0  
1000 s: (149.0...159.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.50  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 144.0...160.0  
1000 s: (140.0...164.0)  
Rack travel in mm : 12.70...13.10

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 10,0 r 2  
 Edition : 05.03.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 087 453  
 Injection pump  
 Pump designation : PES5P120A720LS7174  
 EP type number : 0 412 725 806  
 Governor  
 Governor design. : RQV300...1050PA979  
 Governor no. : 9 420 080 298

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM449 A

1st version kW : 184.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.10...14.30

Del.quantity cm<sup>3</sup>/ : 19.6...19.8

100 s: (19.3...20.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.7...6.9

Del.quantity cm<sup>3</sup>/ : 1.5...2.1

100 s: (1.2...2.4)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1050  
 travel mm : 7.40...7.50

2nd speed rpm : 750  
 travel mm : 4.80...5.20

3rd speed rpm : 500  
 travel mm : 2.70...3.10

4th speed rpm : 300  
 travel mm : 1.10...1.50

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600



Aneroid pressure h: 650  
Del.quantity : 196.0...198.0  
1000 : (193.0...201.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Testing:  
1st rack travel in: 14.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 66...74

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.70...6.90

CONSTANT REGULATION  
Speed rpm : 300...370

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 400  
Rack travel in m: 13.50...13.70  
3rd pressure hPa : 750  
Rack travel in m: 14.20...14.30 \*  
4th pressure hPa : 850  
Rack travel in m: 14.60...14.80  
5th pressure hPa : -  
Rack travel in m: 11.80...12.10

#### START CUT-OUT

Speed 1/min : 220 (240)

H10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm3/ : 217.5...220.5  
1000 s: (214.5...223.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 218.0...222.0  
1000 s: (215.0...225.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 148.0...150.0  
1000 s: (145.0...153.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.10  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a60  
Edition : 18.02.91  
Replaces : 28.9.89  
Test oil : ISO-4113

Combination no. : 9 400 230 109

Injection pump  
Pump designation : PES6A100D320/3RS2691  
EP type number : 9 410 230 030  
Governor  
Governor design. : RSV450...1100AOC2190  
-41R  
Governor no. : 0 420 233 247

Customer-spec. information  
Customer : C.D.C.

Engine : 6CT830

1st version kW : 117.1  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.20...10.30

Del.quantity cm3/ : 8.9...9.1

100 s: (8.7...9.3)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 5.7...5.9

Del.quantity cm3/ : 1.4...1.8  
100 s: (1.2...2.0)

Spread cm3 : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 89.5...91.5

1000 : (87.5...93.5)

Spread cm3 : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 47...55

Testing:

1st rack travel in: 9.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 29...37  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.3

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 450  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 2.00  
Speed rpm : 525...585

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 750  
Rack travel in m: 10.80...11.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 88.5...92.5  
1000 s: (86.5...94.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 450  
Rack travel in mm : 5.70...5.90

H12

Del.quantity cm<sup>3</sup>/ : 14.5...18.5  
1000 s: (12.5...20.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C # 3915683

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a61  
Edition : 18.02.91  
Replaces : 8.8.90  
Test oil : ISO-4113

Combination no. : 9 400 230 110

Injection pump  
Pump designation : PES6A10CD320/3RS2691  
-4

EP type number : 9 410 230 030

Governor

Governor design. : RSV450...1100AOC2190  
-42R

Governer no. : 0 420 233 248

Customer-spec. information

Customer : C.D.C.

Engine : 6CT830

1st version kW : 150.6

Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

H13

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 12.0...12.2

100 s: (11.8...12.4)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 5.7...5.9

Del.quantity cm3/ : 1.4...1.8  
100 s: (1.2...2.0)

Spread cm3 : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 120.0...122.0

1000 : (118.0...124.0)

Spread cm3 : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:

1st rack travel in: 11.10  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 450  
Rack travel in mm : 5.70...5.90

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 750  
Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 134.0...138.0  
1000 s: (132.0...140.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.10  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 450  
Rack travel in mm : 5.70...5.90

Del.quantity cm<sup>3</sup>/ : 14.5...18.5  
1000 s: (12.5...20.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:

: C.D.C # 3915685  
Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm  
before stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a62  
 Edition : 18.02.91  
 Replaces : 1.2.90  
 Test oil : ISO-4113

Combination no. : 9 400 230 111

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 -4  
 EP type number : 9 410 230 030  
 Governor  
 Governor design. : RSV450...1100AOC2190  
 -40R  
 Governor no. : 0 420 233 246

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CT830

1st version kW : 134.2  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

H15

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

---

Rack travel in mm : 11.20...11.30

---

Del.quantity cm3/ : 10.3...10.5  
 100 s: (10.1...10.7)

---

Spread cm3 : 0.4  
 100 s: (0.6)

---

2nd speed rpm : 450.0  
 Rack travel in mm : 5.7...5.9  
 Del.quantity cm3/ : 1.4...1.8  
 100 s: (1.2...2.0)  
 Spread cm3 : 0.6  
 100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Del.quantity : 103.5...105.5  
 1000 : (101.5...107.5)  
 Spread cm3 : 4.00  
 1000 : (6.50)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 49...57

Testing:  
1st rack travel in: 10.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1210...1240  
3rd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 31...39  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.3

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 450  
Rack travel in mm : 5.70...5.90

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 750  
Rack travel in m: 12.00...12.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 111.5...115.5  
1000 s: (109.5...117.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 450  
Rack travel in mm : 5.70...5.90

Del.quantity cm<sup>3</sup>/ : 14.5...18.5  
1000 s: (12.5...20.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C # 3915684  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Adjust stop lever to 0.5...1.0 mm  
before stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a10  
 Edition : 18.02.91  
 Replaces : 1.2.90  
 Test oil : ISO-4113  
 Combination no. : 9 400 230 115  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1250A0C2190  
 -24R  
 Governor no. : 9 420 234 178

Customer-spec. information  
 Customer : C.D.C.

Engine : 6 CTA 8.3

1st version kW : 131.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

H17

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250  
 Rack travel in mm : 10.90...11.00  
 Del. quantity cm<sup>3</sup>/ : 10.3...10.5  
 100 s: (10.1...10.7)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 5.3...5.5  
 Del. quantity cm<sup>3</sup>/ : 1.2...1.6  
 100 s: (1.0...1.8)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Del. quantity : 103.5...105.5  
 1000 : (101.5...107.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (6.50)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 51...59

Testing:



1st rack travel in: 9.90  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1360...1390  
4th rack travel in: 1450  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 26...34  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.9

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.30...5.50

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 12.5...16.5  
1000 s: (10.5...18.5)  
Spread cm3 : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C # 3915981

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a 9  
 Edition : 18.02.91  
 Replaces : 6.3.90  
 Test oil : ISO-4113  
 Combination no. : 9 400 230 116  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1050AOC2190  
 -25R  
 Governor no. : 9 420 234 182

Customer-spec. information  
 Customer : C.D.C

Engine : 6 CT 8.3

1st version kW : 154.4  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

H19

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 12.5...12.7

100 s: (12.3...12.9)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 5.8...6.0  
 Del.quantity cm3/ : 1.5...1.9  
 100 s: (1.3...2.1)  
 Spread cm3 : 0.6  
 100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Del.quantity : 125.5...127.5  
 1000 : (123.5...129.5)  
 Spread cm3 : 4.00  
 1000 : (6.50)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 38...46

Testing:

1st rack travel in: 11.40  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
3rd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1275  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.80...6.00

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.80...6.00  
Del.quantity cm<sup>3</sup>/ : 15.5...19.5  
1000 s: (13.5...21.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C # 3915962

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 b 4  
Edition : 18.02.91  
Replaces : 28.9.89  
Test oil : ISO-4113  
  
Combination no. : 9 400 230 119  
  
Injection pump  
Pump designation : PES6A100D320/3RS2691  
-2  
EP type number : 9 410 230 028  
Governor  
Governor design. : RQV350...1250AB1235R  
Governor no. : 9 420 231 020

Customer-spec. information  
Customer : C.D.C.

Engine : 6 CT-830

1st version kW : 157.0  
2nd version kW : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

H21

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250  
Rack travel in mm : 11.90...12.00  
Del. quantity cm<sup>3</sup>/ : 12.1...12.3  
100 s: (11.9...12.5)  
Spread cm<sup>3</sup> : 0.4  
100 s: (0.6)

2nd speed rpm : 350.0  
Rack travel in mm : 5.0...5.2  
Del. quantity cm<sup>3</sup>/ : 1.4...1.8  
100 s: (1.2...2.0)  
Spread cm<sup>3</sup> : 0.6  
100 s: (0.8)

(B) Setting of injection pump  
with governor

GUIDE SLEEVE TRAVEL  
1st speed rpm : 1400  
travel mm : 8.40...8.50  
2nd speed rpm : 1500  
travel mm : 9.10...9.30  
3rd speed rpm : 350  
travel mm : 0.70...1.10  
4th speed rpm : 450  
travel mm : 1.60...2.00  
5th speed rpm : 250  
travel mm : 0.10...0.50

GUIDE SLEEVE POSITION  
Control-lever position  
Degree: -1  
Speed rpm : 1550  
Rack travel in mm : 6.70...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250

Aneroid pressure h: 700  
Del.quantity : 121.5...123.5  
1000 : (119.5...125.5)  
Spread cm3 : 4.00  
1000 : (6.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 41...49

#### Testing:

1st rack travel in: 10.90  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1415...1445  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 9...15

#### Testing:

Speed rpm : 250  
Minimum rack travel: 7.80  
Speed rpm : 350  
Rack travel in mm : 5.00...5.20

#### CONSTANT REGULATION

Speed rpm : 350...500

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 11.90...12.00  
2nd speed rpm : 750  
Rack travel in m: 12.30...12.50  
3rd speed rpm : 1200  
Rack travel in m: 11.90...12.00  
4th speed rpm : 800  
Rack travel in m: 12.30...12.50

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 12.30...12.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.70...8.90

H22

2nd pressure hPa : 200  
Rack travel in m: 9.80...9.90  
3rd pressure hPa : 390  
Rack travel in m: 11.20...11.60

#### START CUT-OUT

Speed 1/min : 270 (280)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 750  
Del.quantity cm3/ : 132.0...136.0  
1000 s: (130.0...138.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 65.5...69.5  
1000 s: (63.5...71.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.90  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 165.0...185.0  
1000 s: (160.0...190.0)  
Rack travel in mm : 14.60...14.80

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.00...5.20  
Del.quantity cm3/ : 14.0...18.0  
1000 s: (12.0...20.0)  
Spread cm3 : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3912636

Start-of delivery mark/lock = 7.5°  
angular displacement of the cam after  
start of delivery of cylinder 1.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 1,7 A  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE3/10F2100L353  
Type number : 0 460 403 013  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 392 SHJ

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,4  
(from BDC): 0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 2.10...2.50  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1000  
Setting value bar: 4.20...4.80

Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 65.00...66.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

## Full-load del. w/out charge press.:

Speed 1/min: 750  
Del. quantity cm3/  
1000S.: 46.10...47.10

Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 460  
Del. quantity cm3/  
1000S.: 8.50...12.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

## Full-load speed regulation

Speed 1/min: 2300  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 34.00...40.00

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...61.00  
mind 1000S.: 35.00

Shutoff  
electromagnet Volt: 12

## Load-dependent start of delivery: Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Charge press hPa: 1000  
Inj.-qty. cm3/  
difference 1000S.: 10.00...12.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500  
Charge press hPa: 1000

TD-travel  
 difference mm: 0.30...0.50  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1500  
 Charge press hPa: 1000  
 Supply pump  
 pressure  
 difference bar: 0.10...0.30  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
 Charge press hPa: 1000  
 TD travel mm: 6.10...6.90  
 mm: (5.80...7.20)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 2.10...2.50  
 mm: (1.60...3.00)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1900  
 Charge press. hPa: 1000  
 TD travel mm: 5.40...6.20  
 mm: (5.10...6.50)

Shutoff  
 electromagnet Volt: 12  
 6th speed 1/min: 1500  
 Charge press. hPa: 1000  
 TD travel mm: 3.90...4.70  
 mm: (3.60...5.00)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 7.90...8.50  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 4.20...4.80  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 600

Supply-pump  
 pressure bar: 2.30...2.90  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 750\*  
 Charge-air pressure-setting  
 point hPa: 350  
 LDA-stroke mm: 6.2  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.50...56.50  
 1000S.: (53.50...58.50)

3rd speed 1/min: 2500  
 Charge press hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...6.00  
 1000S.: -

5th speed 1/min: 2300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 34.00...40.00  
 1000S.: (33.00...41.00)

9th speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.20...57.60  
 1000S.: (54.20...58.80)

11th speed 1/min: 750  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 60.50...63.50  
 1000S.: (59.50...64.50)

12th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quyntity cm<sup>3</sup>/: 65.00...66.00  
 1000S.: (63.50...67.50)

18th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 46.10...47.10  
1000S.: (44.10...49.10)  
20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 42.00...44.00  
1000S.: (40.00...46.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 460  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 460  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 8.50...12.50  
1000S.: (6.50...14.50)

Dispersion cm3/: 3.0  
1000S.: (3.0)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 4.00...10.00  
1000S.: (2.00...12.00)

3rd speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...7.00  
1000S.: (0.00...7.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Inj.-qty. cm3/: 10.00...12.00  
difference 1000S.: (10.00...12.00)  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1500  
Charge press. hPa: 1000  
Inj.-qty. cm3/: 15.00...21.00  
difference 1000S.: (15.00...21.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: -  
2nd speed 1/min: 1500  
Charge press. hPa: 1000

TD-travel : 0.30...0.50  
difference mm: (0.30...0.50)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: -  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Supply pump-  
pressure : 0.10...0.30  
difference bar: (0.10...0.30)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 42.00...68.00  
1000S.: (42.00...68.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...61.00  
1000S.: (35.00...61.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5,6...6,0  
MS mm: 0,6...1,0  
SVS max. mm: 0,8  
LDA stroke mm: 6,2

Remarks:

:  
:



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CAS 2,5 D  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113

Injection pump : VE3/10F1100R276-3  
Type number : 0 460 403 014  
Customer Part-No. : 1 967 077 C1

Customer-specific information  
Customer : CASE

Engine : D155/440

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 688 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1,0  
mm: 0,98...1,02  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 800

H26

Setting value mm: 2.20...2.60

Supply-pump pressure

Speed 1/min: 800  
Setting value bar: 4.00...4.60

Full-load del. w/out charge press.:

Speed 1/min: 800  
Del. quantity cm3/  
1000S.: 61.00...62.00  
Dispersion cm3/: 2,5  
1000S.: (3.5)

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 13.00...17.00  
Del. quantity cm3/: 2.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1150  
Del. quantity cm3/  
1000S.: 41.00...47.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 75.00...125.00  
mind 1000S.: 75.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1050  
TD travel mm: 3.30...4.10  
mm: (3.00...4.40)  
3rd speed 1/min: 800  
TD travel mm: 1.90...2.30  
mm: (1.40...2.80)  
4th speed 1/min: 600  
TD travel mm: 0.30...1.10  
mm: (0.00...1.40)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.90...3.50  
2nd speed 1/min: 800  
Supply-pump  
pressure bar: 4.00...4.60  
3rd speed 1/min: 1050

Supply-pump  
pressure bar: 4.80...5.40

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1050  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1250  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 1230  
Del. quantity cm<sup>3</sup>/: 0.00...10.00  
1000S.: (0.00...10.00)  
4th speed 1/min: 1180  
Del. quantity cm<sup>3</sup>/: 10.00...40.00  
1000S.: (10.00...40.00)  
5th speed 1/min: 1150  
Del. quantity cm<sup>3</sup>/: 41.00...47.00  
1000S.: (39.50...48.50)  
9th speed 1/min: 1050  
Del. quantity cm<sup>3</sup>/: 60.50...63.50  
1000S.: (59.50...64.50)  
12th speed 1/min: 800  
Del. quantity cm<sup>3</sup>/: 61.00...62.00  
1000S.: (59.20...63.80)  
20th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 57.00...61.00  
1000S.: (56.00...62.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1050  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (11.00...19.00)  
Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (3.5)  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 80.00...110.00  
1000S.: (80.00...110.00)

2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 60.00...80.00  
1000S.: (60.00...80.00)

4th speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 75.00...125.00  
1000S.: (75.00...125.00)

Mounting and assembly dimensions:

Designation

K	mm: 3,2...3,4
KF	mm: 5,1...5,3
MS	mm: 1,1...1,5
SVS max.	mm: 4,9

Remarks:

:  
:

# BOSCH-INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,2 D  
Edition : 18.02.91  
replaces : 09.11.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2100L168-1  
Type number : 0 460 404 042  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 492 HJ

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 800  
Setting value mm: 1.80...2.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 800  
Setting value bar: 3.10...3.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 800  
Del. quantity cm3/  
1000S.: 60.50...61.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 40.50...41.50  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 13.00...17.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2300  
Charge press hPa: 800  
Del. quantity cm3/  
1000S.: 27.00...33.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 37.00...67.00  
mind 1000S.: 37.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)

1.Speed 1/min: 1500  
 TD-travel  
 difference mm: 0.90...1.10  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1500  
 Supply pump  
 pressure  
 difference bar: 0,1...0,3  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
 Charge press hPa: 800  
 TD travel mm: 7.60...8.40  
 mm: (7.30...8.70)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1000  
 Charge press hPa: 800  
 TD travel mm: 1.80...2.20  
 mm: (1.30...2.70)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1500  
 Charge press. hPa: 800  
 TD travel mm: 4.40...5.20  
 mm: (4.10...5.50)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 6.90...7.50

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1000  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 3.10...3.70

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 600  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 1.80...2.40

Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 2100  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700\*  
 Charge-air pressure-setting  
 point hPa: 400  
 LDA-stroke mm: 6,1  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 52.00...53.00  
 1000S.: (50.00...55.00)

3rd speed 1/min: 2450  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 1.00...9.00  
 1000S.: (0.50...9.50)

5th speed 1/min: 2300  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 27.00...33.00  
 1000S.: (26.00...34.00)

9th speed 1/min: 2100  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 52.50...55.50  
 1000S.: (51.00...57.00)

12th speed 1/min: 1500  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynity cm3/: 60.50...61.50  
 1000S.: (59.00...63.00)

18th speed 1/min: 600  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 40.50...41.50  
 1000S.: (38.50...43.50)

20th speed 1/min: 600  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 63.00...66.00  
 1000S.: (61.50...67.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 13.00...17.00  
1000S.: (10.00...20.00)

Dispersion cm3/: 3.0  
1000S.: (3.0)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.50...8.50  
1000S.: (0.50...10.50)

4th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...2.00  
1000S.: (0.00...2.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm3/ : 3.00...5.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
3rd speed 1/min: 1500  
Inj.-qty. cm3/: 8.00...14.00  
difference 1000S.: (8.00...14.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : 0.90...1.10  
difference mm: (0.90...1.10)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : 0.10...0.30  
difference bar: (0.20...0.20)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 45.00...65.00  
1000S.: (45.00...65.00)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...55.00  
1000S.: (35.00...55.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 37.00...67.00  
1000S.: (37.00...67.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3,2...3,4
KF	mm: 5,6...6,0
MS	mm: 0,6...1,0
SVS max.	mm: 3,5
LDA stroke	mm: 6,1
XK	mm: 17,0...19,0
XL	mm: 8,6...12,0

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,2 H  
Edition : 18.02.91  
replaces : 20.07.88  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2100L269  
Type number : 0 460 404 050  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 492 HJ

Power KW: 82  
Speed 1/min: -

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000

J03

Charge press. hPa: 1000  
Setting value mm: 1.50...1.90  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 4.40...5.00  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 66.00...67.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 53.00...54.00  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 13.00...17.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2300  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 27.00...33.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 47.00...67.00  
mind 1000S.: 47.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
 Inj.-qty. cm3/  
 difference 1000S.: 8.00...14.00  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1500  
 TD-travel  
 difference mm: 0.90...1.10  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1500  
 Supply pump  
 pressure  
 difference bar: 0.10...0.30  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
 Charge press hPa: 1000  
 TD travel mm: 7.10...7.90  
 mm: (6.80...8.20)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 1.50...1.90  
 mm: (1.00...2.40)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1500  
 Charge press. hPa: 1000  
 TD travel mm: 4.10...4.90  
 mm: (3.80...5.20)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 7.50...8.10  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 4.40...5.00  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 700

Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 3.30...3.90  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 2100  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700  
 Charge-air pressure-setting  
 point hPa: 450  
 LDA-stroke mm: 6.1  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 62.00...63.00  
 1000S.: (60.00...65.00)

3rd speed 1/min: 2450  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...8.00  
 1000S.: (0.00...8.00)

5th speed 1/min: 2300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 27.00...33.00  
 1000S.: (26.00...34.00)

9th speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 57.70...60.70  
 1000S.: (56.20...62.20)

12th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynity cm3/: 66.00...67.00  
 1000S.: (64.50...68.50)

16th speed 1/min: 600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet volt: 12

Del. quantity cm3/: 52.50...54.50  
1000H.: (52.00...55.00)  
18th speed 1/min: 700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 53.00...54.00  
1000S.: (51.00...56.00)  
20th speed 1/min: 700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 67.50...70.50  
1000S.: (66.00...72.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 13.00...17.00  
1000S.: (10.00...20.00)  
Dispersion cm3/: 3.0  
1000S.: (3.0)  
2nd speed 1/min: 475  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 7.00...13.00  
1000S.: (5.00...15.00)  
4th speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.50...5.50  
1000S.: (0.50...5.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm3/ : 3.00...5.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Inj.-qty. cm3/: 8.00...14.00  
difference 1000S.: (8.00...14.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500

TD-travel : 0.90...1.10  
difference mm: (0.90...1.10)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : 0.10...0.30  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 55.00...75.00  
1000S.: (55.00...75.00)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 37.00...57.00  
1000S.: (37.00...57.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 47.00...67.00  
1000S.: (47.00...67.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,6...6.0  
MS mm: 0,6...1,0  
LDA stroke mm: 6,1  
XK mm: 17.0...19.0  
XL mm: 10.3...13.7

Remarks:

:  
:  
:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,2 K  
Edition : 18.02.91  
replaces : 11.05.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F1600L352  
Type number : 0 460 404 061  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 494 HP  
Speed 1/min: 53

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1200  
Setting value mm: 1.90...2.30  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1200  
Setting value bar: 4,80...5.40  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1200  
Del. quantity cm3/  
1000S.: 44.50...45.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.5  
1000S.: (3.5)

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 11.50...15.50  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1650  
Del. quantity cm3/  
1000S.: 27.00...33.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 45.00...85.00  
mind 1000S.: 45.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1200  
Inj.-qty. cm3/  
difference 1000S.: 10.00...18.00  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1200  
TD-travel  
difference mm: 0.90...1.10  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1600  
TD travel mm: 3.60...4.40  
mm: (3.30...4.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
TD travel mm: 1.90...2.30  
mm: (1.40...2.80)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

2nd speed 1/min: 600  
Supply-pump pressure bar: 2.40...3.00

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
Supply-pump pressure bar: 4.80...5.40

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1600  
Supply-pump pressure bar: 6.40...7.00

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 1600  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

3rd speed 1/min: 1700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.00...33.00  
1000S.: (24.00...36.00)

8th speed 1/min: 1625  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.50...41.50  
1000S.: -

9th speed 1/min: 1600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 38.00...41.00  
1000S.: (36.50...42.50)

12th speed 1/min: 1200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 44.50...45.50  
1000S.: (42.00...48.00)

20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 43.50...46.50  
1000S.: (42.00...48.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1600  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Id'e delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.50...15.50  
1000S.: (9.50...17.50)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

2nd speed 1/min: 480  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.00...8.00  
1000S.: (1.00...9.00)

3rd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

3rd speed 1/min: 1200

Inj.-qty. cm3/: 10.00...18.00  
difference 1000S.: (10.00...18.00)

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1200  
TD-travel : 0.90...1.10  
difference mm: (0.90...1.10)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 50.00...80.00  
1000S.: (50.00...80.00)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 40.00...60.00  
1000S.: (40.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 45.00...85.00  
1000S.: (45.00...85.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,7...5,9  
MS mm: 0,6...1,0  
SVS max. mm: 1,3  
XK mm: 17,0...19,0  
XL mm: 14,2...17,6

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,2 F1  
Edition : 18.02.91  
replaces : 15.11.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2100L269-1  
Type number : 0 460 404 065  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 492.4 HJ

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.50...1.90  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 4.40...5.00  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 66.00...67.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 45.00...46.00  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 13.00...17.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2300  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 27.00...33.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 47.00...67.00  
mind 1000S.: 47.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)

1.Speed 1/min: 1500  
 TD-travel  
 difference mm: 0.90...1.10  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1500  
 Supply pump  
 pressure  
 difference bar: 0.10...0.30  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
 Charge press hPa: 1000  
 TD travel mm: 7.10...7.90  
 mm: (6.80...8.20)  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 1.50...1.90  
 mm: (1.00...2.40)  
 Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1500  
 Charge press. hPa: 1000  
 TD travel mm: 4.10...4.90  
 mm: (3.80...5.20)  
 Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 7.50...8.10  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 4.40...5.00  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 700  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 3.60...4.20  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700\*  
 Charge-air pressure-setting  
 point hPa: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 58.50...59.50  
 1000S.: (56.50...61.50)  
 3rd speed 1/min: 2450  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...8.00  
 1000S.: (0.00...8.00)  
 5th speed 1/min: 2300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 27.00...33.00  
 1000S.: (26.00...34.00)  
 9th speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 56.50...59.50  
 1000S.: (55.00...61.00)  
 12th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynity cm<sup>3</sup>/: 66.00...67.00  
 1000S.: (64.50...68.50)  
 18th speed 1/min: 700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 45.00...46.00  
 1000S.: (43.00...48.00)  
 20th speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 67.70...70.70  
 1000S.: (66.20...72.20)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (10.00...20.00)  
Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)  
2nd speed 1/min: 475  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...13.00  
1000S.: (5.00...15.00)  
4th speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.50...5.50  
1000S.: (0.50...5.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: 3.00...5.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: 8.00...14.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : 0.90...1.10  
difference mm: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : 0.10...0.30  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 52.00...72.00  
1000S.: (52.00...72.00)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...60.00  
1000S.: (40.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 47.00...67.00  
1000S.: (47.00...67.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,6...6,0  
MS mm: 0,6...1,0  
XK mm: 20,0...22,0  
XL mm: 10,0...13,4

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F 2,5 P3  
Edition : 18.02.91  
replaces : 17.07.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F205GR364  
Type number : 0 460 404 066  
Customer Part-No. :

Customer-specific information  
Customer : SOFIM

Engine : 8140.67.2580

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,2  
(from BDC): +0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Setting value mm: 3.10...3.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000

Setting value bar: 4.50...5.10  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 2000  
Del. quantity cm3/  
1000S.: 35.00...36.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 14.00...18.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2200  
Del. quantity cm3/  
1000S.: 13.00...19.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...100.00  
mind 1000S.: 70.00

Shutoff  
electromagnet Volt: 12

Load-dependent start & delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1000  
Inj.-qty. cm3/  
difference 1000S.: 20.00...26.00

Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)

1.Speed 1/min: 1000  
TD-travel  
difference mm: 0.40...0.60

Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1000

Supply pump  
pressure  
difference bar: 0.10...0.30  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1800  
TD travel mm: 7.60...8.40  
mm: (7.30...8.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
TD travel mm: 3.10...3.50  
mm: (2.60...4.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 600  
TD travel mm: 1.20...2.00  
mm: (0.90...2.30)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 2000  
TD travel mm: 8.60...9.40  
mm: (8.30...9.70)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2000  
Supply-pump  
pressure bar: 7.00...7.60  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Supply-pump  
pressure bar: 4.50...5.10  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 500  
Supply-pump  
pressure bar: 3.50...4.10  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12

Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

3rd speed 1/min: 2330  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 2200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...19.00  
1000S.: (12.00...20.00)

8th speed 1/min: 2150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 23,50...30,50  
1000S.: -

12th speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Del. quynity cm<sup>3</sup>/: 35.00...36.00  
1000S.: (33,50...37,50)

15th speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 38.50...41.50  
1000S.: (37.50...42.50)

17th speed 1/min: 600  
Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 31.50...34.50  
1000H.: (30.50...35.50)

20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.50...34.50  
1000S.: (29.50...36.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 14.00...18.00  
1000S.: (11.00...21.00)

Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)  
2nd speed 1/min: 400



Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 7.00...13.00  
1000S.: (5.00...15.00)  
4th speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...2.00  
1000S.: (0.00...2.00)  
  
Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1000  
Inj.-qty. cm3/ : 19.00...21.00  
difference 1000S.: (19.00...21.00)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
Inj.-qty. cm3/: 20.00...26.00  
difference 1000S.: (19.00...27.00)  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1000  
Inj.-qty. cm3/: 2.00...8.00  
difference 1000S.: (2.00...8.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1000  
TD-travel : 0.40...0.60  
difference mm: (0.40...0.60)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
TD-travel : 1.20...1.40  
difference mm: (1.20...1.40)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1000  
Supply pump-  
pressure : 0.10...0.30  
difference bar: (0.10...0.30)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 48.00...68.00  
1000S.: (48.00...68.00)

2nd speed 1/min: 500

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Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 28.00...38.00  
1000S.: (28.00...38.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 70.00...100.00  
1000S.: (70.00...100.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5,6...6,0  
MS mm: 1,6...2,0  
SVS max. mm: 1,9

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,2 M  
Edition : 18.02.91  
replaces : 07.11.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F1600L379  
Type number : 0 460 404 067  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 494 HT

Power KW: 68

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1200  
Charge press. hPa: 1000  
Setting value mm: 2.10...2.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1200  
Charge press hPa: 1000  
Setting value bar: 4,80...5.40  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 61.00...62.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.5  
1000S.: (4.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 52.00...53.00

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 11.00...15.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1690  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 42.00...48.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...100.00  
mind 1000S.: 60.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1200  
Charge press hPa: 1000

Inj.-qty. cm3/  
 difference 1000S.: 19.00...21.00  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1200  
 Charge press hPa: 1000  
 TD-travel  
 difference mm: 0.90...1.10  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1200  
 Charge press hPa: 1000  
 Supply pump  
 pressure  
 difference bar: 0.10...0.30  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1600  
 Charge press hPa: 1000  
 TD travel mm: 3.90...4.70  
 mm: (3.60...5.00)  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1200  
 Charge press hPa: 1000  
 TD travel mm: 2.10...2.50  
 mm: (1.60...3.00)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 1.00...1.80  
 mm: (0.70...2.10)  
 Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

2nd speed 1/min: 750  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 3.00...3.60  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1200  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 4.80...5.40  
 Shutoff  
 electromagnet Volt: 12

4th speed 1/min: 1600  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 6.40...7.00  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 1600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 750\*  
 Charge-air pressure-setting  
 point hPa: 200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 58.00...59.00  
 1000S.: (55.50...61.50)  
 3rd speed 1/min: 1750  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 5th speed 1/min: 1690  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 42.00...48.00  
 1000S.: (39.00...51.00)  
 9th speed 1/min: 1600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 53.50...56.50  
 1000S.: (52.00...58.00)  
 12th speed 1/min: 1200  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 61.10...62.10  
 1000S.: (58.60...64.60)  
 18th speed 1/min: 600  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 52.00...53.00  
1000S.: (49.50...55.50)  
20th speed 1/min: 750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...63.00  
1000S.: (58.50...64.50)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1600  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.00...15.00  
1000S.: (8.50...18.50)  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)  
2nd speed 1/min: 480  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.00...8.00  
1000S.: (1.00...9.00)  
3rd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1200  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/: 19.00...21.00  
difference 1000S.: (19.00...21.00)  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1200  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/: 27.00...35.00  
difference 1000S.: (27.00...35.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1200  
Charge press. hPa: 1000  
TD-travel : 0.90...1.10  
difference mm: (0.90...1.10)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1200  
Charge press. hPa: 1000  
Supply pump-  
pressure : 0.10...0.30  
difference bar: (0.10...0.30)  
Shutoff  
electromagnet Volt: 12  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 58.00...88.00  
1000S.: (58.00...88.00)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 49.00...63.00  
1000S.: (46.00...66.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...100.00  
1000S.: (60.00...100.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,6...6,0  
MS mm: 0,6...1,0  
SVS max. mm: 1,3

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 7,2 T1  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F1350R418  
Type number : 0 460 404 069  
Customer Part-No. :

Customer-specific information  
Customer : MAN

Engine : D 0824 GFD1

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,2  
(from BDC): +0,02(0,0)

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1000  
Setting value mm: 3.40...3.80  
Shutoff  
electromagnet Volt: 24

## Supply-pump pressure

Speed 1/min: 1000  
Setting value bar: 5.20...5.80  
Shutoff  
electromagnet Volt: 24

## Full-load del. w/out charge press.:

Speed 1/min: 1000  
Del. quantity cm3/  
1000S.: 73,10...74,10  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 4,0  
1000S.: (4.5)

## Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 7.00...13.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 6.0  
1000S.: (6.5)

## Full-load speed regulation

Speed 1/min: 1370  
Del. quantity cm3/  
1000S.: 57.00...63.00  
Shutoff  
electromagnet Volt: 24

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...80.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 24

## Inspection-pump test specifications Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1300  
TD travel mm: 6.60...7.40  
mm: (6.30...7.70)  
Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
TD travel mm: 3.40...3.80  
mm: (2.90...4.30)  
Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 800

TD travel mm: 1.10...1.90  
mm: (0.80...2.20)

Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 3.10...3.70

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 1000  
Supply-pump  
pressure bar: 5.20...5.80

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1300  
Supply-pump  
pressure bar: 6.90...7.50  
Shutoff  
electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1300  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1550  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 1480  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...15.00  
1000S.: (0.00...15.00)  
4th speed 1/min: 1430  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 15.00...45.00  
1000S.: (15.00...45.00)  
5th speed 1/min: 1370  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 57.00...63.00  
1000S.: (55.50...64.50)  
9th speed 1/min: 1300

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 73.10...76.10  
1000S.: (71.60...77.60)

12th speed 1/min: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 73.10...74.10  
1000S.: (71.10...76.10)

15th speed 1/min: 800  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 72.20...76.20  
1000S.: (70.70...77.70)

20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 62.80...68.80  
1000S.: (61.80...69.80)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 7.00...13.00  
1000S.: (5.00...15.00)

Dispersion cm<sup>3</sup>/: 6.0  
1000S.: (6.5)

4th speed 1/min: 450  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 65.00...115.00  
1000S.: (65.00...115.00)

2nd speed 1/min: 500

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 40.00...70.00  
1000S.: (40.00...70.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 40.00...80.00  
1000S.: (40.00...80.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5,6...6,0  
MS mm: 1,0...1,4  
SVS max. mm: 5,3

Remarks:  
:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,2 F2  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113  
Injection pump : VE4/10F2100L269-2  
Type number : 0 460 404 070  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 492.4 SHIRG

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.50...1.90  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 4.40...5.00  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 65.00...66.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 43.50...44.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2300  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 27.00...33.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 47.00...67.00  
mind 1000S.: 47.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 12



TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1500  
 TD-travel  
 difference mm: 0.90...1.10  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1500  
 Supply pump  
 pressure  
 difference bar: 0.10...0.30  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
 Charge press hPa: 1000  
 TD travel mm: 6.90...7.70  
 mm: (6.60...8.00)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 1.50...1.90  
 mm: (1.00...2.40)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1500  
 Charge press. hPa: 1000  
 TD travel mm: 4.10...4.90  
 mm: (3.80...5.20)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 7.50...8.10  
 Shutoff

electromagnet Volt: 12  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 4.40...5.00  
 Shutoff

electromagnet Volt: 12  
 3rd speed 1/min: 700  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 3.60...4.20  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700  
 Charge-air pressure-setting  
 point hPa: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 57.00...58.00  
 1000S.: (55.00...60.00)

3rd speed 1/min: 2450  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...8.00  
 1000S.: (0.00...8.00)

5th speed 1/min: 2300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 27.00...33.00  
 1000S.: (26.00...34.00)

9th speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.50...58.50  
 1000S.: (54.00...60.00)

12th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 65.00...66.00  
 1000S.: (63.5...67.5)

18th speed 1/min: 700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 43.50...44.50  
 1000S.: (41.50...46.50)

20th speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm3/: 66.50...69.50  
1000S.: (65.00...71.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 13.00...17.00  
1000S.: (10.00...20.00)

Dispersion cm3/: 3.0  
1000S.: (3.0)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 7.00...13.00  
1000S.: (5.00...15.00)

4th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...5.00  
1000S.: (0.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm3/ : 3.00...5.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Inj.-qty. cm3/ : 8.00...14.00  
difference 1000S.: (8.00...14.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : 0.90...1.10  
difference mm: (0.90...1.10)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : 0.10...0.30  
difference bar: -

Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 52.00...72.00  
1000S.: (52.00...72.00)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 40.00...60.00  
1000S.: (40.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 47.00...67.00  
1000S.: (47.00...67.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,6...6,0  
MS mm: 0,6...1,0

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE 2,3 M9  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2100L297-4  
Type number : 0 460 404 071  
Customer Part-No. :

Customer-specific information  
Customer : OPEL

Engine : 2,3 DTR-MT

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 688 901 000

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 5.10...5.50  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 1000  
Setting value bar: 5.40...6.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 62.50...63.50  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 40.50...41.50  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 290  
Del. quantity cm3/  
1000S.: 13.50...17.50  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2500  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 15.00...21.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100

Del. quantity cm3/: 57.00...59.00  
mind 1000S.: -

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: 10.00...18.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500  
TD-travel  
difference mm: 0.20...0.40  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1500  
Supply pump  
pressure  
difference bar: 0.10...0.30  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
Charge press hPa: 1000  
TD travel mm: 7.80...8.60  
mm: (7.50...8.90)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Charge press hPa: 1000  
TD travel mm: 5.10...5.50  
mm: (4.60...6.00)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800  
Charge press hPa: 1000  
TD travel mm: 1.10...1.90  
mm: (0.80...2.20)

KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1200  
Charge press. hPa: 1000  
TD travel mm: 3.50...4.10  
mm: (3.10...4.50)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
8th speed 1/min: 1200  
Charge press. hPa: 1000  
TD travel mm: 3.80...6.20 B  
mm: -

Shutoff  
electromagnet Volt: 12  
9th speed 1/min: 300  
Charge press. hPa: 1000  
TD travel mm: 1.50...3.50 A  
mm: (1.30...3.70)

Shutoff  
electromagnet Volt: 12  
10th speed 1/min: 800  
Charge press. hPa: 1000  
TD travel mm: 3.50...5.90 \*  
mm: (2.90...6.50)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.90...7.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.40...6.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.60...5.20

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 300  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.20...4.80 \*

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2100  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 800\*  
Charge-air pressure-setting  
point hPa: 500  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 59.50...60.50  
1000S.: (57.00...63.00)  
3rd speed 1/min: 2700  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)  
5th speed 1/min: 2500  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...21.00  
1000S.: (14.00...22.00)  
9th speed 1/min: 2100  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 51.30...53.70  
1000S.: (50.20...54.80)  
10th speed 1/min: 800  
KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.50...42.50  
1000S.: -  
12th speed 1/min: 1200  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quynntity cm<sup>3</sup>/: 62.50...63.50  
1000S.: (60.70...65.30)  
18th speed 1/min: 500  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.50...41.50  
1000S.: (38.70...43.30)  
20th speed 1/min: 800  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.50...63.50  
1000S.: -

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 290  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Id'le delivery:

1st speed 1/min: 290  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.50...17.50  
1000S.: (11.50...19.50)  
Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)  
2nd speed 1/min: 320  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...13.00  
1000S.: (6.50...13.50)  
4th speed 1/min: 380  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...2.60  
1000S.: (0.00...2.60)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/ : 6.00...8.00  
difference 1000S.: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: 10.00...18.00  
difference 1000S.: (10.00...18.00)  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : 0.20...0.40  
difference mm: (0.20...0.40)  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : 0.10...0.30  
difference bar: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 250  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 55.00...65.00  
1000S.: (55.00...65.00)

2nd speed 1/min: 400  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 43.00...53.00  
1000S.: (40.00...50.00)

3rd speed 1/min: 100  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 57.00...59.00  
1000S.: (50.00...66.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 0.8...1.2

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : BMW 2,4 F  
Copl. date: : 742  
Edition : 18.02.91  
replaces : 26.08.87  
Calibrating oil : ISO-4113

Injection pump : VE6/10F2300R206  
Type number : 0 460 406 047  
Customer Part-No. :  
Customer Part-No. :

Customer-specific information  
Customer : BMW

Engine : M21D24 W

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 500  
Setting value mm: 4.10...4.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

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Speed 1/min: 1500  
Charge press hPa: 500  
Setting value bar: 6.00...6.40  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 500  
Del. quantity cm3/  
1000S.: 25.50...26.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 23.50...26.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 400  
Charge press hPa: 500  
Del. quantity cm3/  
1000S.: 6.00...10.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2500  
Charge press hPa: 500  
Del. quantity cm3/  
1000S.: 11.50...17.50  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...50.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
Charge press hPa: 500  
TD travel mm: 6.10...6.90  
mm: (5.80...7.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Charge press hPa: 500  
TD travel mm: 4.10...4.50  
mm: (3.80...4.80)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
Charge press hPa: 500  
TD travel mm: 0.80...1.60  
mm: (0.50...1.90)

Shutoff  
electromagnet Volt: 12  
8th speed 1/min: 1000  
Charge press. hPa: 500  
TD travel mm: 4,20...5,80 B

Shutoff  
electromagnet Volt: 12  
9th speed 1/min: 500  
Charge press. hPa: 500  
TD travel mm: 2.70...4.30 A  
Shutoff  
electromagnet Volt: 12

#### Supply-pump pressure characteristic:

1st speed 1/min: 2000  
Charge press. hPa: 500  
Supply-pump  
pressure bar: 7.30...7.70

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Charge press. hPa: 500  
Supply-pump  
pressure bar: 6.00...6.40

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 500  
Charge press. hPa: 500  
Supply-pump  
pressure bar: 3.20...3.60

Shutoff  
electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2300

Charge press. hPa: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

#### Delivery-quant. and breakaway char.:

3rd speed 1/min: 2650  
Charge press. hPa: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)

5th speed 1/min: 2500  
Charge press. hPa: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.50...17.50  
1000S.: (9.50...19.50)

9th speed 1/min: 2300  
Charge press. hPa: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.50...28.50  
1000S.: (24.50...29.50)

10th speed 1/min: 1750  
Charge press. hPa: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.20...31.80  
1000S.: (27.50...32.50)

12th speed 1/min: 1250  
Charge press. hPa: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.50...26.50  
1000S.: (23.70...28,70)

13th speed 1/min: 1250  
Charge press. hPa: -100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 19.60...22.40  
1000S.: (18.80...23.20)

17th speed 1/min: 1250  
Charge press. hPa: 120  
Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 21.20...24.80  
1000H.: (20.20...25.80)

18th speed 1/min: 500  
Charge press. hPa: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 23.50...26.50  
1000S.: (22.50...27.50)

Mech. shutoff:  
Mech. Abststellung:



1st speed 1/min: 2300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.00...10.00  
1000S.: (3.00...13.00)

Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (3.0)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)

Automatic starting fuel delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.00...32.00  
1000S.: (21.00...33.00)

2nd speed 1/min: 480  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.70...22.30  
1000S.: (16.00...24.00)

3rd speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 46.00...48.00  
1000S.: (42.00...52.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...50.00  
1000S.: (35.00...55.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation	
K	mm: 3,2...3,4
KF	mm: 6,4...6,6
MS	mm: 1,4...1,6
SVS max.	mm: 3,9
ADA stroke	mm: 3,8
XK	mm: 17.0...19,0
XL	mm: 9,6...13,0

Remarks:

:  
:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ONA 3,4 A  
Edition : 08.04.91  
replaces : 03.11.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/10F1800R209  
Type number : 0 460 406 048  
Customer Part-No. :

Customer-specific information  
Customer : ONAN

Engine : L634T

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,2  
(from BDC): +0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1400  
Charge press. hPa: 800  
Setting value mm: 3.90...4.30  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1400  
Charge press hPa: 800  
Setting value bar: 4.80...5.40  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 800  
Del. quantity cm3/  
1000S.: 58.50...59.50

Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 44.00...45.00

Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 14.00...18.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

## Full-load speed regulation

Speed 1/min: 1900  
Charge press hPa: 800  
Del. quantity cm3/  
1000S.: 37.00...43.00

Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 42.00...92.00  
mind 1000S.: 42.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1400  
Charge press hPa: 800  
Inj.-qty. cm3/  
difference 1000S.: 9.50...17.50  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement

correttore anticipo iniezione (SV)

1.Speed 1/min: 1400

Charge press hPa: 800

TD-travel  
difference mm: 0.50...0.70

Shutoff

electromagnet Volt: 12

SP press.-dif.measurement

pompa di mandata (FP)

1.Speed 1/min: 1400

Charge press hPa: 800

Supply pump

pressure  
difference bar: 0,10...0,3

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1800

Charge press hPa: 800

TD travel mm: 5.40...6.20  
mm: (5.10...6.50)

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1400

Charge press hPa: 800

TD travel mm: 3.90...4.30  
mm: (3.40...4.80)

Shutoff

electromagnet Volt: 12

4th speed 1/min: 800

Charge press hPa: 800

TD travel mm: 1.00...1.80  
mm: (0.70...2.10)

Shutoff

electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 800

Charge press. hPa: 800

Supply-pump  
pressure bar: 2.70...3.30

Shutoff

electromagnet Volt: 12

2nd speed 1/min: 1400

Charge press. hPa: 800

Supply-pump  
pressure bar: 4.80...5.40

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1800

Charge press. hPa: 800

Supply-pump  
pressure bar: 6.00...6.60

Shutoff

electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700

Charge press. hPa: 800

Shutoff

electromagnet Volt: 12

Overflow : 41.70...83.40  
quantity cm3/10s: (26.70...98.40)

2nd speed 1/min: 1800

Charge press. hPa: 800

Shutoff

electromagnet Volt: 12

Overflow : 55.60...139.00  
quantity cm3/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700

Charge-air pressure-setting  
point hPa: 300

LDA-stroke mm: 6,5

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 50.50...51.50  
1000S.: (48.70...53.30)

2nd speed 1/min: 2000

Charge press. hPa: 800

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 5,50...14,50  
1000S.: -

3rd speed 1/min: 2050

Charge press. hPa: 800

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 0.00...3.00  
1000S.: -

5th speed 1/min: 1900

Charge press. hPa: 800

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 37.00...43.00  
1000S.: (36.00...44.00)

8th speed 1/min: 1950

Charge press. hPa: 800

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 23.00...31.00  
1000S.: (22.00...32.00)

9th speed 1/min: 1800

Charge press. hPa: 800

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 51.50...54.50  
1000S.: (51.20...55.80)

12th speed 1/min: 1400

Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 58.50...59.50  
                     1000S.: (56.70...61.30)  
 18th speed 1/min: 700  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 44.00...45.00  
                     1000S.: (42.20...46.80)  
 20th speed 1/min: 700  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 58.00...61.00  
                     1000S.: -

Mech. shutoff:  
 Mech. Abstimmung:

1st speed 1/min: 1800  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: -  
 Shutoff  
 electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 350  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 14.00...18.00  
                     1000S.: (12.00...20.00)  
 Dispersion cm<sup>3</sup>/: 3.0  
                     1000S.: (3.0)  
 2nd speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...6.00  
                     1000S.: (0.00...6.00)  
 3rd speed 1/min: 350  
 Del. quantity cm<sup>3</sup>/: 26.50...33.50  
                     1000S.: (26.00...34.00)

Shutoff  
 electromagnet Volt: 12

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1400  
 Inj.-qty. cm<sup>3</sup>/ : 5.00...7.00  
 difference 1000S.: -

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1400  
 Charge press. hPa: 800  
 Inj.-qty. cm<sup>3</sup>/: 9.50...17.50  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1400  
 Charge press. hPa: 800  
 TD-travel : 0.50...0.70  
 difference mm: -  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1400  
 Charge press. hPa: 800  
 Supply pump-  
 pressure : 0.10...0.30  
 difference bar: -  
 Shutoff  
 electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 220  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 42.00...92.00  
                     1000S.: (42.00...92.00)

2nd speed 1/min: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 18.00...42.00  
                     1000S.: (18.00...42.00)

4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 42.00...92.00  
                     1000S.: (42.00...92.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
 K mm: -  
 KF mm: 5,6...6,0  
 MS mm: 0,6...1,0

SVS max.	mm: 1,7
LDA stroke	mm: 6,5
XK	mm: 20,0...22,0
XL	mm: 10,1...13,5

Remarks:

⋮

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 3,4 B  
Edition : 18.02.91  
replaces : 22.04.88  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/10F1400R209-1  
Type number : 0 460 406 052  
Customer Part-No. :

Customer-specific information  
Customer : ONAN

Engine : L634T-Auto

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,2  
(from BDC): +0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1400  
Charge press. hPa: 800  
Setting value mm: 4.30...4.70  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

K07

Speed 1/min: 1100  
Charge press hPa: 800  
Setting value bar: 3.80...4.40  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1100  
Charge press. hPa: 800  
Del. quantity cm3/  
1000S.: 61.00...62.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 44.50...45.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 14.00...18.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 1480  
Charge press hPa: 800  
Del. quantity cm3/  
1000S.: 42.00...46.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 42.00...92.00  
mind 1000S.: 42.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1100  
Charge press hPa: 12  
Inj.-qty. cm3/  
difference 1000S.: 8.50...16.50  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement

correttore anticipo iniezione (SV)

1.Speed 1/min: 1100

Charge press hPa: 800

TD-travel  
difference mm: 0.50...0.70

Shutoff

electromagnet Volt: 12

SP press.-dif.measurement

pompa di mandata (FP)

1.Speed 1/min: 1100

Charge press hPa: 800

Supply pump

pressure

difference bar: 0,10...0,30

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

3rd speed 1/min: 1400

Charge press hPa: 800

TD travel mm: 4.30...4.70  
mm: (3.80...5.20)

Shutoff

electromagnet Volt: 12

4th speed 1/min: 800

Charge press hPa: 800

TD travel mm: 1.40...2.20  
mm: (1.10...2.50)

Shutoff

electromagnet Volt: 12

5th speed 1/min: 1100

Charge press. hPa: 800

TD travel mm: 2.70...3.30  
mm: (2.30...3.70)

Shutoff

electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 700

Charge press. hPa: 800

Supply-pump  
pressure bar: 2.30...2.90

Shutoff

electromagnet Volt: 12

2nd speed 1/min: 1100

Charge press. hPa: 800

Supply-pump  
pressure bar: 3.80...4.40

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1400

Charge press. hPa: 800

Supply-pump  
pressure bar: 4.80...5.40

Shutoff

electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700

Charge press. hPa: 800

Shutoff

electromagnet Volt: 12

Overflow : 41.70...83.40

quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 1400

Charge press. hPa: 800

Shutoff

electromagnet Volt: 12

Overflow : 55.60...139.00

quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700

Charge-air pressure-setting  
point hPa: 200

LDA-stroke mm: 6,5

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 47.00...48.00

1000S.: (45.20...49.80)

2nd speed 1/min: 1560

Charge press. hPa: 800

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 14.00...22.00

1000S.: -

3rd speed 1/min: 1600

Charge press. hPa: 800

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0,00...3.00

1000S.: -

5th speed 1/min: 1480

Charge press. hPa: 800

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 42.00...46.00

1000S.: (40.00...48.00)

9th speed 1/min: 1400

Charge press. hPa: 800

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 56.50...59.50

1000S.: (55.70...60.30)

12th speed 1/min: 1100

Charge press. hPa: 800

Shutoff

electromagnet Volt: 12

Del. quynity cm<sup>3</sup>/: 61.00...62.00

1000S.: (59,20...63.80)

18th speed 1/min: 700

Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 44.50...45.50  
1000S.: (42.70...47.30)  
20th speed 1/min: 700  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 57.50...60,50  
1000S.: -

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 14.00...18.00  
1000S.: (12.00...20.00)  
Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)  
2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)  
3rd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 26.50...33.50  
1000S.: -

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1100  
Inj.-qty. cm<sup>3</sup>/: 5.00...7.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press. hPa: 800  
Inj.-qty. cm<sup>3</sup>/: 8.50...16.50  
difference 1000S.: -

Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1100  
Charge press. hPa: 800  
TD-travel : 0.50...0.70  
difference mm: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1100  
Charge press. hPa: 800  
Supply pump-  
pressure : 0.10...0.30  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 220  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.00...92.00  
1000S.: -

2nd speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 18.00...42.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.00...92.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5.6...6,0  
MS mm: 0,6...1,0  
SVS max. mm: 1,7  
LDA stroke mm: 6,5  
XK mm: 20,0...22,0  
XL mm: 8,9...12,3

Remarks:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ONA 3,4 C  
Edition : 18.02.91  
replaces : 03.11.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/10F1500R20A-2  
Type number : 0 460 406 060  
Customer Part-No. :

Customer-specific information  
Customer : ONAN

Engine : L634TA HD

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42,00...50,00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,2  
(from BDC): +0,02(0,04)

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1400  
Charge press. hPa: 800  
Setting value mm: 4.30...4.70

Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 800  
Setting value bar: 3.80...4.40  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 800  
Del. quantity cm3/  
1000S.: 55.00...56.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 42.50...43.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 14.00...18.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 1640  
Charge press hPa: 800  
Del. quantity cm3/  
1000S.: 20.00...24.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 42.00...92.00  
mind 1000S.: 42.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1100  
 Charge press hPa: 800  
 Inj.-qty. cm3/  
 difference 1000S.: 8.50...16.50  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1100  
 Charge press hPa: 800  
 TD-travel  
 difference mm: 0.50...0.70  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1100  
 Charge press hPa: 800  
 Supply pump  
 pressure  
 difference bar: 0.10...0.30  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

3rd speed 1/min: 1400  
 Charge press hPa: 800  
 TD travel mm: 4.30...4.70  
 mm: (3.80...5.20)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 800  
 Charge press hPa: 800  
 TD travel mm: 1.40...2.20  
 mm: (1.10...2.50)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1100  
 Charge press. hPa: 800  
 TD travel mm: 2.70...3.30  
 mm: (2.30...3.70)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 700  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 2.30...2.90  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1100  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 3.80...4.40

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1400  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 4.80...5.40  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 1500  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700  
 Charge-air pressure-setting  
 point hPa: 350  
 LDA-stroke mm: 6,5  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 48.00...49.00  
 1000S.: (46.20...50.80)

3rd speed 1/min: 1740  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0,00...3.00  
 1000S.: -

5th speed 1/min: 1640  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 20.00...24.00  
 1000S.: (18.00...26.00)

8th speed 1/min: 1580  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 43.00...51,00  
 1000S.: -

9th speed 1/min: 1500  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 52.50...55.50  
 1000S.: (51.70...56.30)

12th speed 1/min: 1400

Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.50...56.50  
 1000S.: (53.70...58.30)  
 18th speed 1/min: 700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 42.50...43.50  
 1000S.: (40.70...45.30)  
 20th speed 1/min: 700  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.00...58.00  
 1000S.: -

Mech. shutoff:  
 Mech. Abstimmung:

1st speed 1/min: 1500  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 350  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 14.00...18.00  
 1000S.: (12.00...20.00)  
 Dispersion cm<sup>3</sup>/: 3.0  
 1000S.: (3.0)  
 2nd speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...6.00  
 1000S.: (0.00...6.00)  
 3rd speed 1/min: 350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 26.50...33.50  
 1000S.: -

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1100  
 Inj.-qty. cm<sup>3</sup>/: 5.00...7.00  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12

K12

3rd speed 1/min: 1100  
 Charge press. hPa: 800  
 Inj.-qty. cm<sup>3</sup>/: 8.50...16.50  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1100  
 Charge press. hPa: 800  
 TD-travel : 0.50...0.70  
 difference mm: -  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1100  
 Charge press. hPa: 800  
 Supply pump-  
 pressure : 0.10...0.30  
 difference bar: -  
 Shutoff  
 electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 220  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 42.00...92.00  
 1000S.: -

2nd speed 1/min: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 18.00...42.00  
 1000S.: -

4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 42.00...92.00  
 1000S.: -

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm: -  
 KF mm: 5,6...6.0  
 MS mm: 0,6...1,0  
 SVS max. mm: 2,1  
 LDA stroke mm: 6,5

Remarks:

:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ONA 3,4 E  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/10F1800R209-5  
Type number : 0 460 406 065  
Customer Part-No. :

Customer-specific information  
Customer : ONAN

Engine : L634T

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,2  
(from BDC): +0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1400  
Charge press. hPa: 800  
Setting value mm: 3.90...4.30  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1400  
Charge press hPa: 800  
Setting value bar: 4.80...5.40  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 800  
Del. quantity cm3/  
1000S.: 58.50...59.50

Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 44.00...45.00

Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 14.00...18.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

## Full-load speed regulation

Speed 1/min: 1900  
Charge press hPa: 800  
Del. quantity cm3/  
1000S.: 37.00...43.00

Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 42.00...92.00  
mind 1000S.: 42.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1400  
Charge press hPa: 800  
Inj.-qty. cm3/  
difference 1000S.: 9.50...17.50  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement

correttore anticipo iniezione (SV)

1.Speed 1/min: 1400  
Charge press hPa: 800  
TD-travel  
difference mm: 0.50...0.70  
Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1400  
Charge press hPa: 800  
Supply pump  
pressure  
difference bar: 0,10...0,30  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1800  
Charge press hPa: 800  
TD travel mm: 5.40...6.20  
mm: (5.10...6.50)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1400  
Charge press hPa: 800  
TD travel mm: 3.90...4.30  
mm: (3.40...4.80)  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800  
Charge press hPa: 800  
TD travel mm: 1.00...1.80  
mm: (0.70...2.10)  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 800  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 2.70...3.30  
bar: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1400  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 4.80...5.40  
bar: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1800  
Charge press. hPa: 800

Supply-pump  
pressure bar: 6.00...6.60  
bar: -

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1800  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.50...51.50  
1000S.: (48.70...53.30)  
2nd speed 1/min: 2000  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5,50...14,50  
1000S.: -  
3rd speed 1/min: 2050  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
5th speed 1/min: 1900  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...43.00  
1000S.: (36.00...44.00)  
8th speed 1/min: 1950  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 23.00...31.00  
1000S.: (22.00...32.00)  
9th speed 1/min: 1800  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 51.50...54.50  
 1000S.: (50.70...55.30)  
 12th speed 1/min: 1400  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 58.50...59.50  
 1000S.: (56.70...61.30)  
 18th speed 1/min: 700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 44.00...45.00  
 1000S.: (42.20...46.80)  
 20th speed 1/min: 700  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 57.50...60.50  
 1000S.: -

Mech. shutoff:  
 Mech. Abstellung:

1st speed 1/min: 1800  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 350  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 14.00...18.00  
 1000S.: (12.00...20.00)  
 Dispersion cm3/: 3.0  
 1000S.: (3.0)  
 2nd speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...6.00  
 1000S.: -  
 3rd speed 1/min: 350  
 Del. quantity cm3/: 26.50...33.50  
 1000S.: (26.00...34.00)  
 Shutoff  
 electromagnet Volt: 12

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1400

Inj.-qty. cm3/ : 5.00...7.00  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1400  
 Charge press. hPa: 800  
 Inj.-qty. cm3/: 9.50...17.50  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1400  
 Charge press. hPa: 800  
 TD-travel : 0.50...0.70  
 difference mm: -  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1400  
 Charge press. hPa: 800  
 Supply pump-  
 pressure : 0.10...0.30  
 difference bar: -  
 Shutoff  
 electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 220  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 42.00...92.00  
 1000S.: -

2nd speed 1/min: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 18.00...42.00  
 1000S.: -

4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 42.00...92.00  
 1000S.: -

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm: -

KF	mm: 5,6...6,0
MS	mm: 0,6...1,0
SVS max.	mm: 1,7

Remarks:

:

:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ONA 3,4 F  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/10F1500R209-7  
Type number : 0 460 406 067  
Customer Part-No. :

Customer-specific information  
Customer : ONAN

Engine : L634TA HD

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,2  
(from BDC): +0,02(0,04)

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 800  
Setting value mm: 3.80...4.20

Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 800  
Setting value bar: 3.80...4.40  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 800  
Del. quantity cm3/  
1000S.: 56.50...57.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 39.50...40.50

Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

## Full-load speed regulation

Speed 1/min: 1640  
Charge press hPa: 800  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 37.00...87.00  
mind 1000S.: 37.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

3rd speed 1/min: 1500  
 Charge press hPa: 800  
 TD travel mm: 3.80...4.20  
 mm: (3.30...4.70)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 800  
 Charge press hPa: 800  
 TD travel mm: 0.90...1.70  
 mm: (0.60...2.00)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1100  
 Charge press. hPa: 800  
 TD travel mm: 2.20...2.80  
 mm: (1.80...3.20)

Shutoff  
 electromagnet Volt: 12

# Supply-pump pressure characteristic:

1st speed 1/min: 700  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 2.30...2.90  
 Shutoff

electromagnet Volt: 12  
 2nd speed 1/min: 1100  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 3.80...4.40  
 Shutoff

electromagnet Volt: 12  
 3rd speed 1/min: 1500  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 5.10...5.70  
 Shutoff  
 electromagnet Volt: 12

# Overflow quantity at overflow valve:

1st speed 1/min: 700  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 1500  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...153.00)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
 Charge-air pressure-setting point hPa: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 47.50...48.50  
 1000S.: (45.70...50.30)

3rd speed 1/min: 1700  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: -

5th speed 1/min: 1640  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...14.00  
 1000S.: (8.00...16.00)

8th speed 1/min: 1580  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 33.00...41.00  
 1000S.: -

9th speed 1/min: 1500  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 53.00...56.00  
 1000S.: (52.20...56.80)

12th speed 1/min: 1400  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynntity cm<sup>3</sup>/: 56.50...57.50  
 1000S.: (54.70...59.30)

18th speed 1/min: 700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 39.50...40.50  
 1000S.: (37.70...42.30)

20th speed 1/min: 700  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.50...58.50  
 1000S.: -

Mech. shutoff:  
 Mech. Abststellung:

1st speed 1/min: 1500  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (11.00...19.00)  
Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: -

3rd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 26.50...33.50  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 220  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...87.00  
1000S.: -

2nd speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...37.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...87.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: -  
KF mm: 5,6...6,0  
MS mm: 0,6...1,0  
SVS max. mm: 1,9

Remarks:

:  
:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ONA 3,4 G  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/10F1800R421  
Type number : 0 460 406 069  
Customer Part-No. :

Customer-specific information  
Customer : ONAN

Engine : 6ATA3.4 AUTOM.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC):  $\pm 0,02(0,04)$

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1600  
Charge press. hPa: 1000  
Setting value mm: 3.20...3.60

Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1600  
Charge press hPa: 1000  
Setting value bar: 6.00...6.60  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1600  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 56.50...57.50

Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000S.: 37.50...38.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000S.: 15.00...19.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 1900  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 30.50...36.50

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 40.00...80.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.diff.measurement:

Speed 1/min: 1600  
Charge press hPa: 1000  
Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: 16.0...24.00

Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1600  
 Charge press hPa: 1000  
 TD-travel  
 difference mm: 0,40...0,60  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1600  
 Charge press hPa: 1000  
 Supply pump  
 pressure  
 difference bar: 0.10...0,30  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1800  
 Charge press hPa: 1000  
 TD travel mm: 3.80...4.60  
 mm: (3.50...4.90)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1600  
 Charge press hPa: 1000  
 TD travel mm: 3.20...3.60  
 mm: (2.70...4.10)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1200  
 Charge press hPa: 1000  
 TD travel mm: 1.70...2.50  
 mm: (1.40...2.80)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1200  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 4.60...5.20

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1600  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 6.00...6.60

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1800  
 Charge press. hPa: 1000

Supply-pump  
 pressure bar: 6.70...7.30  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 1800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 800  
 Charge-air pressure-setting  
 point hPa: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/ : 51.50...52.50  
 1000S.: (49.70...54.30)

2nd speed 1/min: 1990  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/ : 0.00...3.00  
 1000S.: (0.00...3.00)

3rd speed 1/min: 1910  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/ : 15.00...35.00  
 1000S.: (15.00...35.00)

5th speed 1/min: 1900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/ : 30.50...36.50  
 1000S.: (29.50...37.50)

9th speed 1/min: 1800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/ : 53.00...56.00  
 1000S.: (52.00...57.00)

12th speed 1/min: 1600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynity cm<sup>3</sup>/ : 56.50...57.50  
 1000S.: (54.50...59.50)

18th speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.50...38.50  
1000S.: (35.70...40.30)  
20th speed 1/min: 500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 56.00...62.00  
1000S.: -

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1800  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...19.00  
1000S.: (13.00...21.00)  
Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)  
2nd speed 1/min: 490  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

2nd speed 1/min: 1600  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/: 10.00...12.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1600  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/: 16.00...24.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1600

Charge press. hPa: 1000  
TD-travel : 0.40...0.60  
difference mm: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1600  
Charge press. hPa: 1000  
Supply pump-  
pressure : 0.10...0.30  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 220  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...80.00  
1000S.: -

2nd speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...80.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5.6...6.0  
MS mm: 0,6...1,0  
XK mm: 20,0...22,0  
XL mm: 11,4...14,8

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ONA 3,4 H  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/10F1800R437  
Type number : 0 460 406 070  
Customer Part-No. :

Customer-specific information  
Customer : ONAN

Engine : 6AT 3.4 IND.

Power KW: 104  
Speed 1/min: 1800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Indicator setting  
Piston stroke mm: 1,0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1600

K24

Charge press. hPa: 1000  
Setting value mm: 4.50...4.90  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1200  
Charge press hPa: 1000  
Setting value bar: 3.90...4.50  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1600  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 58.50...59.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000S.: 38.00...39.00  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000S.: 14.50...18.50  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 1870  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 46.50...52.50  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 40.00...80.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications

# Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1800  
 Charge press hPa: 1000  
 TD travel mm: 5.20...6.00  
 mm: (4.90...6.30)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1600  
 Charge press hPa: 1000  
 TD travel mm: 4.50...4.90  
 mm: (4.00...5.40)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1200  
 Charge press hPa: 1000  
 TD travel mm: 2.60...3.40  
 mm: (2.30...3.70)

Shutoff  
 electromagnet Volt: 12

## Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 1.50...2.10  
 bar: (1.30...2.30)

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1200  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3.90...4.50  
 bar: (3.70...4.70)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1600  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 5.30...5.90  
 bar: (5.10...6.10)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1800  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 6.00...6.60  
 bar: (5.80...6.80)

Shutoff  
 electromagnet Volt: 12

## Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12

Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 1800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...153.00)

## Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
 Charge-air pressure-setting point hPa: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 52.00 53.00  
 1000S.: (50.20...54.80)

2nd speed 1/min: 1900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

3rd speed 1/min: 1895  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 15.00...55.00  
 1000S.: (25.00...45.00)

5th speed 1/min: 1870  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 46.50...52.50  
 1000S.: (45.50...53.50)

9th speed 1/min: 1800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.00...58.00  
 1000S.: (54.20...58.80)

12th speed 1/min: 1600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 58.50...59.50  
 1000S.: (56.70...61.30)

18th speed 1/min: 400  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 38.00...39.00  
 1000S.: (36.20...40.80)

20th speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12



Del. quantity cm<sup>3</sup>/: 54.00...57.00  
1000S.: -

Mech. shutoff:  
Mech. Abst.ellung:

1st speed 1/min: 1800  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 14.50...18.50  
1000S.: (12.50...20.50)

Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

2nd speed 1/min: 640  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 220  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...80.00  
1000S.: -

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...80.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

KF	mm: 5.6...6.0
MS	mm: 0.6...1.0
XK	mm: 20.0...22.0
XL	mm: 11.5...14.9

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 2,7 A  
Edition : 18.02.91  
replaces : 16.10.86  
Calibrating oil : ISO-4113

Injection pump : VE3/11F1250L163-1  
Type number : 0 460 413 002  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8035.06.200

Power KW: 38  
Speed 1/min: 1250

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.2  
(from BDC): +0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Setting value mm: 2.80...3.20

K27

Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 800  
Del. quantity cm3/  
1000S.: 62.50...63.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.5  
1000S.: (4.0)

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 15.50...19.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1350  
Del. quantity cm3/  
1000S.: 37.00...43.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 80.00...130.00  
mind 1000S.: 80.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1250  
TD travel mm: 4.40...5.20  
mm: (4.10...5.50)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
TD travel mm: 2.80...3.20  
mm: (2.30...3.70)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800

TD travel           mm: 1.10...1.90  
                     mm: (0.80...2.20)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed     1/min: 500  
 Supply-pump  
 pressure       bar: 3.40...4.00  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed     1/min: 1000  
 Supply-pump  
 pressure       bar: 5.70...6.30  
 4th speed     1/min: 1250  
 Supply-pump  
 pressure       bar: 6.80...7.40  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 1st speed     1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow       : 41.70...83.40  
 quantity     cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed     1/min: 1250  
 Shutoff  
 electromagnet Volt: 12  
 Overflow       : 55.60...139.00  
 quantity     cm<sup>3</sup>/10s: (40.60...153.00)  
 Delivery-quant. and breakaway char.:  
 2nd speed     1/min: 1450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...1.00  
                     1000S.: -  
 3rd speed     1/min: 1400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 6.00...14.00  
                     1000S.: (5.00...15.00)  
 5th speed     1/min: 1350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 37.00...43.00  
                     1000S.: (34.00...46.00)  
 9th speed     1/min: 1250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 61.50...64.50  
                     1000S.: (60.00...66.00)  
 Shutoff  
 electromagnet Volt: 12  
 12th speed    1/min: 800

Shutoff  
 electromagnet Volt: 12  
 Del. quynity cm<sup>3</sup>/: 62.50...63.50  
                     1000S.: (60.00...66.00)  
 20th speed    1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 53.50...56.50  
                     1000S.: (52.00...58.00)  
 Mech. shutoff:  
 Mech. Abst $\ddot{u}$ llung:  
 1st speed     1/min: 1250  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: 12  
 Electr. shutoff:  
 1st speed     1/min: 400  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
 Idle delivery:  
 1st speed     1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 15.50...19.50  
                     1000S.: (13.50...21.50)  
 Dispersion    cm<sup>3</sup>/: 3.5  
                     1000S.: (3.5)  
 2nd speed     1/min: 475  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...1.00  
                     1000S.: -  
 3rd speed     1/min: 425  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 6.00...12.00  
                     1000S.: (5.00...13.00)  
 Automatic starting fuel delivery:  
 1st speed     1/min: 150  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 90.00...140.00  
                     1000S.: -  
 2nd speed     1/min: 250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 30.00...50.00  
                     1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...130.00  
1000s.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 1.4...1.8
SVS max.	mm: 4.7

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : STE 2,6K1  
Edition : 18.02.91  
replaces : 16.02.86  
Calibrating oil : ISO-4113  
  
Injection pump : VE3/11F1200R263-1  
Type number : 0 460 413 007  
Customer Part-No. :

Customer-specific information  
Customer : STEYR

Engine : 'D311-85

Power KW: 41  
Speed 1/min: 1200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Indicator setting  
Piston stroke mm: 1,0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000

L02

Setting value mm: 5.80...6.20

Supply-pump pressure

Speed 1/min: 1000  
Setting value bar: 6.20...6.80

Full-load del. with charge press.:

Speed 1/min: 1000  
Del. quantity cm3/  
1000S.: 78.00...79.00  
Dispersion cm3/: 3.5  
1000S.: (3.5)

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 11.00...15.00  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1300  
Del. quantity cm3/  
1000S.: 17.00...23.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 84.00...134.00  
mind 1000S.: 84.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1200  
TD travel mm: 6.90...7.70  
mm: (6.60...8.00)  
3rd speed 1/min: 1000  
TD travel mm: 5.80...6.20  
mm: (5.30...6.70)  
4th speed 1/min: 500  
TD travel mm: 1.60...2.40  
mm: (1.30...2.70)

Supply-pump pressure characteristic:

1st speed 1/min: 1200  
Supply-pump  
pressure bar: 7.00...7.60  
2nd speed 1/min: 1000  
Supply-pump  
pressure bar: 6.20...6.80  
3rd speed 1/min: 500

Supply-pump  
pressure bar: 4.30...4.90

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1200  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

3rd speed 1/min: 1350  
Del. quantity cm<sup>3</sup>/: 0.00...2.60  
1000S.: -  
5th speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/: 17.00...23.00  
1000S.: (16.00...24.00)  
8th speed 1/min: 1250  
Del. quantity cm<sup>3</sup>/: 45.00...53.00  
1000S.: (44.00...54.00)  
9th speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/: 74.50...77.50  
1000S.: (73.70...78.30)  
12th speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/: 78.00...79.00  
1000S.: (76.20...80.30)  
20th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 72.50...75.50  
1000S.: (71.50...76.50)

Delivery-quant. and breakaway char.:

Inj.-qty.values,temp.-compensated  
temperatura

Del. quantity cm<sup>3</sup>/: 0.00...2.60  
1000S.: (0.00...2.60)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 11.00...15.00  
1000S.: (9.00...17.00)  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)  
2nd speed 1/min: 330  
Del. quantity cm<sup>3</sup>/: 3.00...9.00  
1000S.: (2.00...10.00)

3rd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...2.60  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 170  
Del. quantity cm<sup>3</sup>/: 84.00...134.00  
1000S.: -

2nd speed 1/min: 270  
Del. quantity cm<sup>3</sup>/: 37.00...73.00  
1000S.: -

4th speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 84.00...134.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : -  
Rated voltage : -

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,6...6.0  
MS mm: 1,2...1,6  
SVS max. mm: 5,0  
XK mm: 17,0...19,0  
XL mm: 12,6...16.0

Remarks:

:  
:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : STE 4,0 H  
Edition : 18.02.91  
replaces : 30.09.86  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1100R94-1  
Type number : 0 460 414 011  
Customer Part-No. :

Customer-specific information  
Customer : STEYR

Engine : WD411.89/90

Power KW: 52  
Speed 1/min: 1100

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Setting value mm: 5.20...5.60

Supply-pump pressure

Speed 1/min: 1000  
Setting value bar: 5.20...5.80

Full-load del. with charge press.:

Speed 1/min: 1000  
Del. quantity cm3/  
1000S.: 73.50...74.50  
Dispersion cm3/: 3.5  
1000S.: (3.5)

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 11.50...15.50  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1150  
Del. quantity cm3/  
1000S.: 50.00...56.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...120.00  
mind 1000S.: 70.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 5.90...6.70  
mm: (5.60...7.00)  
3rd speed 1/min: 1000  
TD travel mm: 5.20...5.60  
mm: (4.70...6.10)  
4th speed 1/min: 500  
TD travel mm: 0.80...1.60  
mm: (0.50...1.90)

Supply-pump pressure characteristic:

1st speed 1/min: 1100  
Supply-pump  
pressure bar: 5.70...6.30  
2nd speed 1/min: 1000  
Supply-pump  
pressure bar: 5.20...5.80  
3rd speed 1/min: 500  
Supply-pump  
pressure bar: 2.80...3.40

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41.70...83.40  
quantity cm3/10s: (26.70...98.40)  
2nd speed 1/min: 1080  
Overflow : 55.60...139.00  
quantity cm3/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1270  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 1220  
Del. quantity cm3/: 0.00...10.00  
1000S.: (0.00...10.00)  
4th speed 1/min: 1170  
Del. quantity cm3/: 10.00...40.00  
1000S.: (10.00...40.00)  
5th speed 1/min: 1150  
Del. quantity cm3/: 50.00...56.00  
1000S.: (49.00...57.00)  
9th speed 1/min: 1080  
Del. quantity cm3/: 72.00...75.00  
1000S.: (71.00...76.00)  
12th speed 1/min: 1000  
Del. quantity cm3/: 73.50...74.50  
1000S.: (71.70...76.30)  
20th speed 1/min: 500  
Del. quantity cm3/: 68.00...71.00  
1000S.: (66.50...72.50)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1080  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 300  
Del. quantity cm3/: 11.50...15.50  
1000S.: (9.50...17.50)  
Dispersion cm3/: 3.5  
1000S.: (3.5)  
2nd speed 1/min: 340  
Del. quantity cm3/: 2.00...8.00  
1000S.: (1.00...9.00)  
3rd speed 1/min: 400  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 170  
Del. quantity cm3/: 70.00...120.00  
1000S.: -

2nd speed 1/min: 250

Del. quantity cm3/: 35.00...65.00  
1000S.: -

4th speed 1/min: 100  
Del. quantity cm3/: 70.00...120.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,1...5,5  
MS mm: 0,8...1,2  
SVS max. mm: 1,9

Remarks:

:  
:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 3,9A  
Edition : 18.02.91  
replaces : 08.84  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1250L164  
Type number : 0 460 414 013  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8045.05.200

Power KW: 58  
Speed 1/min: 1250

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.2  
(from BDC): +0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 800  
Setting value mm: 3.80...4.20

L06

Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 800  
Setting value bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 800  
Del. quantity cm<sup>3</sup>/  
1000S.: 73.50...74.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (4.0)

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000S.: 21.00...25.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1350  
Del. quantity cm<sup>3</sup>/  
1000S.: 29.00...35.00

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 80.00...130.00  
mind 1000S.: 80.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1250  
TD travel mm: 7.60...8.40  
mm: (7.30...8.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 800  
TD travel mm: 3.80...4.20  
mm: (3.30...4.70)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500

TD travel mm: 1.20...2.00  
mm: (1.00...2.20)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 3.60...4.20

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 700  
Supply-pump  
pressure bar: 4.30...4.60

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 800

Supply-pump  
pressure bar: 5.10...5.70  
Shutoff

electromagnet Volt: 12  
4th speed 1/min: 1250

Supply-pump  
pressure bar: 7.00...7.60  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...153.00)  
2nd speed 1/min: 1250

Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1430  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...1.00  
1000S.: (0.00...1.00)

3rd speed 1/min: 1380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.00...16.00  
1000S.: (6.00...16.00)

5th speed 1/min: 1350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29.00...35.00  
1000S.: (26.00...38.00)

9th speed 1/min: 1250

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 68.50...71.50  
1000S.: (67.00...73.00)

Shutoff  
electromagnet Volt: 12  
12th speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 73.50...74.50  
1000S.: (71.00...77.00)

20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 64.00...67.00  
1000S.: (62.50...68.50)

Delivery-quant. and breakaway char.:

Inj.-qty.values,temp.-compensated  
temperatura

Del. quantity cm<sup>3</sup>/: 0.00...1.00  
1000S.: (0.00...1.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1250  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 21.00...25.00  
1000S.: (19.00...27.00)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

2nd speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.50...8.50  
1000S.: (1.50...9.50)

3rd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...1.00  
1000S.: (0.00...1.00)

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 90.00...140.00  
1000S.: -

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...65.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...130.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5.3...5.7  
MS mm: 1,4...1,8  
SVS max. mm: 4.6

Remarks:

:  
:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : STE 4,0 K  
Edition : 18.02.91  
replaces : 10.85  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1200R94-2  
Type number : 0 460 414 014  
Customer Part-No. :

Customer-specific information  
Customer : SNF

Engine : WD411.45 47kW

Power KW: 47  
Speed 1/min: 1200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 800  
Setting value mm: 3.40...3.80

Supply-pump pressure

Speed 1/min: 800  
Setting value bar: 4.70...5.30

Full-load del. with charge press.:

Speed 1/min: 1000  
Del. quantity cm3/  
1000S.: 70.50...71.50  
Dispersion cm3/: 3.5  
1000S.: (3.5)

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 21.00...25.00  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1300  
Del. quantity cm3/  
1000S.: 19.00...25.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 78.00...128.00  
mind 1000S.: 78.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1200  
TD travel mm: 6.60...7.40  
mm: (6.30...7.70)  
3rd speed 1/min: 800  
TD travel mm: 3.40...3.80  
mm: (2.90...4.30)  
4th speed 1/min: 500  
TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

Supply-pump pressure characteristic:

1st speed 1/min: 1200  
Supply-pump  
pressure bar: 6.50...7.10  
2nd speed 1/min: 800  
Supply-pump  
pressure bar: 4.70...5.30  
3rd speed 1/min: 500  
Supply-pump  
pressure bar: 3.20...3.80

Overlow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1180  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1340  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)  
5th speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/: 19.00...25.00  
1000s.: (18.00...26.00)  
8th speed 1/min: 1250  
Del. quantity cm<sup>3</sup>/: 51.00...59.00  
1000s.: (50.00...60.00)  
9th speed 1/min: 1180  
Del. quantity cm<sup>3</sup>/: 69.50...72.50  
1000s.: (68.50...73.50)  
12th speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/: 70.50...71.50  
1000s.: (68.70...73.30)  
20th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 66.50...69.50  
1000s.: (65.00...71.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1180  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 21.00...25.00  
1000s.: (19.00...27.00)  
Dispersion cm<sup>3</sup>/: 3.5  
1000s.: (3.5)  
2nd speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 5.00...11.00  
1000s.: (3.50...12.50)  
3rd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 170  
Del. quantity cm<sup>3</sup>/: 78.00...128.00  
1000s.: (78.00...128.00)  
2nd speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: 35.00...65.00  
1000s.: (35.00...65.00)

4th speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 78.00...128.00  
1000s.: (78.00...128.00)

Shutoff electromagnet:

Cut-in  
min voltage : -  
Rated voltage : -

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,3...5,7  
MS mm: 0,8...1,2  
SVS max. mm: 3,1

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 3,6 C  
Edition : 18.02.91  
replaces : 09.85  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1250L164-2  
Type number : 0 460 414 024  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8045.06.220

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42,00...50,00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,2  
(from BDC): +0,02(0,04)

Indicator setting  
Piston stroke mm: 1,0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 800

L11

Setting value mm: 3.00...3.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 800  
Setting value bar: 4.10...4.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 800  
Del. quantity cm3/  
1000S.: 63.50...64.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.0)

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 23.00...27.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1350  
Del. quantity cm3/  
1000S.: 29.00...35.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 90.00...140.00  
mind 1000S.: 90.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1250  
TD travel mm: 5.40...6.20  
mm: (5.10...6.50)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 800  
TD travel mm: 3.00...3.40  
mm: (2.50...3.90)

Shutoff  
electromagnet Volt: 12

4th speed 1/min: 600  
TD travel mm: 1.20...2.00  
mm: (0.90...2.30)

Shutoff

electromagnet Volt: 12

5th speed 1/min: 1000

TD travel mm: 4.80...5.60  
mm: (4.50...5.90)

Shutoff

electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600

Supply-pump pressure bar: 3.20...3.80

Shutoff

electromagnet Volt: 12

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 800

Supply-pump pressure bar: 4.10...4.70

Shutoff

electromagnet Volt: 12

4th speed 1/min: 1250

Supply-pump pressure bar: 6.10...6.70

Shutoff

electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500

Shutoff

electromagnet Volt: 12

Overflow : 41.70...83.40

quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 1250

Shutoff

electromagnet Volt: 12

Overflow : 55.60...139.00

quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1410

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...3.00

1000S.: (0.00...3.00)

3rd speed 1/min: 1380

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 9.00...17.00

1000S.: (8.00...18.00)

5th speed 1/min: 1350

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 29.00...35.00  
1000S.: (26.00...38.00)

9th speed 1/min: 1250

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 54.00...57.00  
1000S.: (52.00...59.00)

Shutoff

electromagnet Volt: 12

12th speed 1/min: 800

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 63.50...64.50  
1000S.: (60.50...67.50)

20th speed 1/min: 500

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 57.00...61.00  
1000S.: (55.50...62.50)

Mech. shutoff:

Mech. Abstellung:

1st speed 1/min: 1250

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff

electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 350

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff

electromagnet volt: -

Idle delivery:

1st speed 1/min: 350

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 23.00...27.00  
1000S.: (21.00...29.00)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

2nd speed 1/min: 425

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 4.00...10.00  
1000S.: (3.00...11.00)

3rd speed 1/min: 480

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 150

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 100.00...150.00  
1000S.: (100.00...150.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...50.00  
1000S.: (30.00...50.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 90.00...140.00  
1000S.: (90.00...140.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5,0...5,4  
MS mm: 1,4...1,8  
SVS max. mm: 4,3

Remarks:

⋮



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 2,0 B  
Edition : 18.02.91  
replaces : 09.05.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F2250R229  
Type number : 0 460 414 030  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : T 4.20

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1,00  
mm: +0,02(0,06)  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 800  
Setting value mm: 3.10...3.50

AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 800  
Setting value bar: 7.10...7.70  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000S.: 63.00...64.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (5.0)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 17.30...18.30

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.0)

## Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000S.: 10.00...12.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.0  
1000S.: (4.0)

## Full-load speed regulation

Speed 1/min: 2500  
Charge press hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000S.: 23.50...25.50

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 62.00...98.00  
mind 1000s.: 62.00

KSB/AFB

Valve Volt: 12

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000

Charge press hPa: 800

TD travel mm: 6.00...6.80  
mm: (5.70...7.10)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1500

Charge press hPa: 800

TD travel mm: 3.10...3.50  
mm: (2.70...3.90)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

4th speed 1/min: 1000

Charge press hPa: 800

TD travel mm: 0.60...1.40  
mm: (0.30...1.70)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

8th speed 1/min: 800

Charge press. hPa: 800

TD travel mm: 1.20...3.20 B  
mm: (1.00...3.40) B

KSB/AFB

valve Volt: -

Shutoff

electromagnet Volt: 12

9th speed 1/min: 500

Charge press. hPa: 800

TD travel mm: 1.90...2.10 A  
mm: (1.20...2.80) A

KSB/AFB

valve Volt: -

Shutoff

electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1000

Charge press. hPa: 800

Supply-pump

pressure bar: 6.10...6.70

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

2nd speed 1/min: 1500

Charge press. hPa: 800

Supply-pump

pressure bar: 7.10...7.70

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 2000

Charge press. hPa: 800

Supply-pump

pressure bar: 8.10...8.70

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Overflow : 41.70...83.40

quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 2250

Charge press. hPa: 800

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Overflow : 55.60...139.00

quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 800

Charge-air pressure-setting

point hPa: 300

LDA-stroke mm: 6,5

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 33.90...34.90

1000s.: (30.90...37.90)

3rd speed 1/min: 2600

Charge press. hPa: 800

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...10.00  
 1000S.: (0.00...10.00)  
 5th speed 1/min: 2500  
 Charge press. hPa: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 23.50...25.50  
 1000S.: (20.50...28.50)  
 9th speed 1/min: 2250  
 Charge press. hPa: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 66.00...70.00  
 1000S.: (65.00...71.00)  
 12th speed 1/min: 1250  
 Charge press. hPa: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 63.00...64.00  
 1000S.: (61.00...66.00)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 17.30...18.30  
 1000S.: (14.80...20.80)  
 20th speed 1/min: 500  
 Charge press. hPa: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 58,50...65,50  
 1000S.: -

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 400  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...12.00  
 1000S.: (7.00...15.00)

Dispersion cm<sup>3</sup>/: 3.0  
 1000S.: (4.0)  
 2nd speed 1/min: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 2.00...8.00  
 1000S.: (1.00...9.00)

Automatic starting fuel delivery:

2nd speed 1/min: 350  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...30.00  
 1000S.: (10.00...30.00)

4th speed 1/min: 100  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 62.00...98.00  
 1000S.: (60.00...100.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation	
K	mm: 3,2...3,4
KF	mm: K-OT
MS	mm: 0,35.0,75
SVS max.	mm: 4,3
LDA stroke	mm: 6,5
XK	mm: 20.0...22.0
XL	mm: 9,6...13,0

Remarks:

:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : LEY 2,5 A  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F2000R347  
Type number : 0 460 414 069  
Customer Part-No. :

Customer-specific information  
Customer : LANDROVER

Engine : 2,5L DI TCI

Power kW: -  
Speed 1/min: 2000

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 116

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1,54  
mm: 0,02(0,06)

Outlet : C

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1600  
Charge press. hPa: 1000  
Setting value mm: 3.10...3.50  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1600  
Charge press hPa: 1000  
Setting value bar: 6.10...6.70  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 63.10...64.10  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (4.0)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 34.50...35.50  
Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 10.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 4.0  
1000S.: (4.0)

## Full-load speed regulation

Speed 1/min: 2100  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 52.30...58.30

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 80.00...130.00  
mind 1000S.: 80.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
Charge press hPa: 1000  
TD travel mm: 5.30...6.10  
mm: (4.80...6.60)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1600  
Charge press hPa: 1000  
TD travel mm: 3.10...3.50  
mm: (2.50...4.10)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1200  
Charge press hPa: 1000  
TD travel mm: 0.70...1.50  
mm: (0.20...2.00)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2000  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7.40...8.00  
bar: (7.20...8.20)

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1600  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.10...6.70  
bar: (5.90...6.90)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.00...5.60  
bar: (4.80...5.80)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000

Overflow quantity at overflow valve:

1st speed 1/min: 800  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...100.08  
quantity cm<sup>3</sup>/10s: (40.60...115.08)  
2nd speed 1/min: 2000  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 12  
Overflow : 83.40...166.80  
quantity cm<sup>3</sup>/10s: (68.40...181.80)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting point hPa: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 53.10...54.10  
1000s.: (50.40...56.80)

3rd speed 1/min: 2400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...15.00  
1000s.: (0.00...15.00)

5th speed 1/min: 2100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 52.30...58.30  
1000s.: (50.30...60.30)

9th speed 1/min: 2000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.10...64.10  
1000s.: (58.90...65.30)

10th speed 1/min: 1800  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0,00...1.50  
1000s.: -

12th speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quynity cm<sup>3</sup>/: 63.10...64.10  
1000s.: (60,80...66,40)

15th speed 1/min: 800  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0,00...2,50  
1000s.: -

18th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.50...35.50  
1000s.: (31.80...38.20)

20th speed 1/min: 800  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0,00...2.00  
1000S.: -

Delivery-quant. and breakaway char.:

Inj.-qty.values,temp.-compensated  
temperatura

1st speed 1/min: 800  
Charge-air pressure-setting  
point hPa: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 53.10...54.10  
1000S.: (50.40...56.80)

3rd speed 1/min: 2400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...15.00  
1000S.: (0.00...15.00)

5th speed 1/min: 2100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 52.30...58.30  
1000S.: (50.30...60.30)

9th speed 1/min: 2000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.10...64.10  
1000S.: (58.90...65.30)

10th speed 1/min: 1800  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.50...63.50  
1000S.: (62.00...62.00)

12th speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 63.10...64.10  
1000S.: (60.80...66.40)

15th speed 1/min: 800  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.50...66.50  
1000S.: (64.00...64.00)

18th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.50...35.50  
1000S.: (31.80...38.20)

20th speed 1/min: 800  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 39.50...43.50  
1000S.: (41.50...41.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (1.50...1.50)

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (7.00...17.00)

Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.0)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.00...8.00  
1000S.: -

3rd speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 82.00...132.00  
1000S.: (80.00...134.00)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...70.00  
1000S.: (30.00...70.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...130.00  
1000S.: (80.00...130.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm: 3,2...3,4
KF	mm: KOT
MS	mm: -
SVS max.	mm: 2,7
XK	mm: 21,8...23.8
XL	mm: 13,3...16.7

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : LEY 2,5 B  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113

Injection pump : VE4/11F1900R347-1  
Type number : 0 460 414 080  
Customer Part-No. :

Customer-specific information  
Customer : LANDROVER

Engine : 2,5L DI TCI

Power KW: -  
Speed 1/min: 1900

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 116

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1,54  
mm: 0,02(0,06)

Outlet : C

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1600  
Charge press. hPa: 1000  
Setting value mm: 3.10...3.50  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1600  
Charge press hPa: 1000  
Setting value bar: 6.10...6.70  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 58.80...59.80

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (4.0)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 34.50...35.50

Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 4.0  
1000S.: (4.0)

## Full-load speed regulation

Speed 1/min: 2000  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 44.50...50.50

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 80.00...130.00  
mind 1000S.: 80.00  
Shutoff  
electromagnet Volt: 12



Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1850  
Charge press hPa: 1000  
TD travel mm: 4.40...5.20  
mm: (3.90...5.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1600  
Charge press hPa: 1000  
TD travel mm: 3.10...3.50  
mm: (2.50...4.10)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1200  
Charge press hPa: 1000  
TD travel mm: 0.70...1.50  
mm: (0.20...2.00)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1850  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.40...8.00  
bar: (7.20...8.20)

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1600  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.10...6.70  
bar: (5.90...6.90)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.00...5.60  
bar: (4.80...5.80)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000

Overflow quantity at overflow valve:

1st speed 1/min: 800  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...100.00  
quantity cm<sup>3</sup>/10s: (40.60...115.00)  
2nd speed 1/min: 1850  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 12  
Overflow : 83.40...166.80  
quantity cm<sup>3</sup>/10s: (68.40...181.80)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting  
point hPa: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 46.50...47.50  
1000S.: (43.80...50.20)

3rd speed 1/min: 2200  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...10.00  
1000S.: (0.00...10.00)

5th speed 1/min: 2000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 44.50...50.50  
1000S.: (42.50...52.50)

9th speed 1/min: 1850  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 56.00...60.00  
1000S.: (54.80...61.20)

Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...1.50  
1000S.: -

12th speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 57.80...58.80  
1000S.: (55.5...61.10)

15th speed 1/min: 800  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...2.50  
1000S.: -

18th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.50...35.50  
1000S.: (31.80...38.20)

20th speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...2.00  
1000S.: -

## Delivery-quant. and breakaway char.:

Inj.-qty.values,temp.-compensated  
temperatura

1st speed 1/min: 800  
Charge-air pressure-setting  
point hPa: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 46.50...47.50  
1000S.: (43.80...50.20)

3rd speed 1/min: 2200  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...10.00  
1000S.: (0.00...10.00)

5th speed 1/min: 2000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 44.50...50.50  
1000S.: (42.50...52.50)

9th speed 1/min: 1850  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 56.00...60.00  
1000S.: (54.80...61.20)

Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.50...63.50  
1000S.: (62.00...62.00)

12th speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 58.80...59.80  
1000S.: (56.50...62.10)

15th speed 1/min: 800  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 55.50...60.50  
1000S.: (58.00...58.00)

18th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.50...35.50  
1000S.: (31.80...38.20)

20th speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 39.50...43.50  
1000S.: (41.50...41.50)

## Mech. shutoff:

## Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (1.50...1.50)

## Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (7.00...17.00)  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.0)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.00...8.00  
3rd speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)

## Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 82.00...132.00  
1000S.: (80.00...134.00)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...70.00  
1000S.: (30.00...70.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...130.00  
1000S.: (80.00...130.00)

## Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

## Mounting and assembly dimensions:

## Designation

K	mm: 3,2...3,4
KF	mm: KOT
MS	mm: -
SVS max.	mm: -

Remarks:

⋮



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW 1,6 X15  
Edition : 18.02.91  
replaces : 11.05.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2400R348  
Type number : 0 460 484 027  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 086-1.6l

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembl. : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.10...3.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250

Setting value bar: 5.00...5.60  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 31.50...32.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 7.00...9.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 4.50...5.50

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2650  
Del. quantity cm3/  
1000S.: 12.00...16.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...85.00  
mind 1000S.: 35.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm3/  
difference 1000S.: 5.00...11.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250

TD-travel  
difference mm: 0.60...0.80

Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1250

Supply pump  
pressure  
difference bar: 0.90...1.30  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2250  
TD travel mm: 7.30...8.10  
mm: (7.00...8.40)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 3.10...3.50  
mm: (2.60...4.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
TD travel mm: 1.10...1.90  
mm: (0.80...2.20)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 3.40...4.00  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 5.00...5.60

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2250  
Supply-pump  
pressure bar: 7.30...7.90  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm3/10s: (27.80...97.30)  
2nd speed 1/min: 2250

Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...138.90  
quantity cm3/10s: (41.70...152.90)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...6.00  
1000S.: (0.00...6.00)

5th speed 1/min: 2650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 12.00...16.00  
1000S.: (10.00...18.00)

8th speed 1/min: 2550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 19.50...29.50  
1000S.: (18.50...30.50)

9th speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 30.00...32.00  
1000S.: (28.80...33.20)

12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 31.50...32.50  
1000S.: (29.80...34.20)

20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 22.50...25.50  
1000S.: (21.00...27.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 7.00...9.00  
1000S.: (4.00...12.00)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 8.50...11.50  
1000S.: (6.00...14.00)

High Idle:

1st speed 1/mi: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 7.00...9.00  
1000S.: (4.00...12.00)

Residual:

1.Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 4.50...5.50  
1000S.: (3.00...7.00)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 4.10...6.10  
1000S.: (2.60...7.60)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

3rd speed 1/min: 1250  
Inj.-qty. cm3/: 5.00...11.00  
difference 1000S.: (4.00...12.00)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1250  
Inj.-qty. cm3/: 2.00...8.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):

1st speed 1/min: 1250  
TD-travel : 0.60...0.80  
difference mm: -

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD-travel : 1.30...1.70  
difference mm: (1.00...2.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Supply pump-  
pressure : 0.90...1.30  
difference bar: (0.70...1.50)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...85.00  
1000S.: (35.00...85.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 15.00...35.00  
1000S.: (15.00...35.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...85.00  
1000S.: (35.00...85.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3,2...3,4
KF	mm: 5,3...5.7
MS	mm: 1,4...1.6

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW 1,9 C  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2200R355  
Type number : 0 460 484 029  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 086-1.9L.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.10...3.50  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1250

Setting value bar: 5.50...6.10  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 35.50...36.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

## Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 7.00...9.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

## Residual-Delivery Setting

Speed 1/min: 575  
Del. quantity cm3/  
1000S.: 2.00...3.00

Shutoff  
electromagnet Volt: 12

## Full-load speed regulation

Speed 1/min: 2525  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...85.00  
mind 1000S.: 35.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: 12  
Inj.-qty. cm3/  
difference 1000S.: 5.00...11.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250

TD-travel  
difference mm: 0.30...0.50  
Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1250  
Supply pump  
pressure  
difference bar: 0.30...1.10  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2200  
TD travel mm: 7.10...7.90  
mm: (6.80...8.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 3.10...3.50  
mm: (2.60...4.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
TD travel mm: 1.10...1.90  
mm: (0.80...2.20)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Supply-pump  
pressure bar: 4.30...4.90

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 5.50...6.10

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2200  
Supply-pump  
pressure bar: 7.70...8.30  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm3/10s: (27.80...97.30)  
2nd speed 1/min: 2200

Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...138.90  
quantity cm3/10s: (41.70...152.90)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...6.00  
1000s.: (0.00...6.00)

5th speed 1/min: 2525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 10.00...14.00  
1000s.: (8.00...16.00)

8th speed 1/min: 2425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 18.00...28.00  
1000s.: (17.00...29.00)

9th speed 1/min: 2200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 31.00...33.00  
1000s.: (29.80...34.20)

12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.50...36.50  
1000s.: (33.80...38.20)

17th speed 1/min: 750  
Shutoff  
electromagnet volt: 12  
Del. quantity cm3/: 30.00...33.00  
1000H.: (28.50...34.50)

20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 27.50...32.50  
1000s.: (25.00...35.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm3/: 0.00...3.00  
1000s.: (0.00...3.00)

Idle delivery:

Damper set qty.:

2nd speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12



Del. quantity cm<sup>3</sup>/: 11.00...13.00  
1000S.: (8.00...16.00)

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

High Idle:

1st speed 1/mi: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

Residual:

1.Rotacao 1/min: 575  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.00...3.00  
1000S.: (0.50...4.50)  
2nd speed 1/min: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.50...4.50  
1000S.: (1.00...6.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

3rd speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 5.00...11.00  
difference 1000S.: (4.00...12.00)  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 2.00...8.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):

1st speed 1/min: 1250  
TD-travel : 0.30...0.50  
difference mm: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD-travel : 0.80...1.20  
difference mm: (0.50...1.50)  
Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 1250  
Supply pump-  
pressure : 0.50...0.90  
difference bar: (0.30...1.10)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 18.00...38.00  
1000S.: (18.00...38.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3,2...3,4
KF	mm: 5,1...5,3
MS	mm: 1,1...1,3
XK	mm: 17.0...19.0
XL	mm: 9,3...12,7

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN 2,0 P4  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2300R317-3  
Type number : 0 460 484 041  
Customer Part-No. :

Customer-specific information  
Customer : RNUR

Engine : F8Q - 742

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1250  
Setting value mm: 4.10...4.50  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1250

M03

Setting value bar: 4.50...5.10  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 31.00...32.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

## Low-idle speed regulation

Speed 1/min: 410  
Del. quantity cm3/  
1000S.: 6,5...10,5  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2,5  
1000S.: (3,0)

## Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 1.00...5.00  
Shutoff  
electromagnet Volt: 12

## Full-load speed regulation

Speed 1/min: 2450  
Del. quantity cm3/  
1000S.: 22.00...28.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...70.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm3/  
difference 1000S.: 9.00...13.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250

TD-travel  
 difference mm: 0.30...0.50  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1250  
 Supply pump  
 pressure  
 difference bar: 0,10...0,30  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2250  
 TD travel mm: 7.80...8.60  
 mm: (7.80...8.60)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1250  
 TD travel mm: 4.10...4.50  
 mm: (3.60...5.00)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 750  
 TD travel mm: 1.90...2.70  
 mm: (1.60...3.00)

Shutoff  
 electromagnet Volt: 12  
 6th speed 1/min: 2000  
 TD travel mm: 7.20...8.00  
 mm: (6.90...8.30)

Shutoff  
 electromagnet Volt: 12  
 8th speed 1/min: 500  
 TD travel mm: 1,90...4,30  
 mm: -

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 9th speed 1/min: 310  
 TD travel mm: 0.60...3.00  
 mm: -

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
 Supply-pump  
 pressure bar: 3.10...3.70  
 Shutoff  
 electromagnet Volt: 12

2nd speed 1/min: 1250  
 Supply-pump  
 pressure bar: 4.50...5.10  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2250  
 Supply-pump  
 pressure bar: 7.00...7.60  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 2250  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2950  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...5.00  
 1000s.: (0.00...5.00)

3rd speed 1/min: 2650  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 7.00...15.00  
 1000s.: (6.00...16.00)

5th speed 1/min: 2450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 22.00...28.00  
 1000s.: (21.00...29.00)

9th speed 1/min: 2250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 31.50...33.50  
 1000s.: (30.20...34.80)

10th speed 1/min: 2000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 30.30...32.30  
 1000s.: (29.00...33.60)

11th speed 1/min: 1625  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 29.70...32.70  
 1000s.: (28.90...33.50)

12th speed 1/min: 1250  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 31.00...32.00  
1000S.: (29.20...33.80)  
20th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.10...33.10  
1000S.: (29.30...33.90)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 410  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 410  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.50...10.50  
1000S.: (4.50...12.50)

High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...11.00  
1000S.: (5.00...13.00)

Residual:

1.Rotacao 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 1.00...5.00  
1000S.: (1.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 7.70...9.70  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 9.00...13.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1250

Ini.-qty. cm<sup>3</sup>/: 2.00...8.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : 0.30...0.50  
difference mm: (0.30...0.50)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD-travel : 0.10...0.50  
difference mm: (0.00...0.60)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : 0.10...0.30  
difference bar: (0.10...0.30)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Supply pump-  
pressure : 0.20...0.60  
difference bar: (0.20...0.60)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 210  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...75.00  
1000S.: (45.00...75.00)

2nd speed 1/min: 310  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...45.00  
1000S.: (15.00...45.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...70.00  
1000S.: (40.00...70.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 3,2...3,4  
KF mm: 5,3...5,7  
MS mm: 1,1...1,5  
SVS max. mm: 2,7

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW 2,4 S7  
Edition : 18.02.91  
replaces : 19.07.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE5/8F2100L358  
Type number : 0 460 485 003  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 153-2.4L.-T4

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 2.80...3.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250

M07

Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 35.50...36.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0

Low-idle speed regulation

Speed 1/min: 415  
Del. quantity cm3/  
1000S.: 7.00...9.00

Shutoff  
electromagnet Volt: 12

Residual-Delivery Setting

Speed 1/min: 540  
Del. quantity cm3/  
1000S.: 7.50...8.50

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2400  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...85.00  
mind 1000S.: 35.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: 7.00...13.00

Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)

1.Speed 1/min: 1500  
TD-travel  
difference mm: 0.30...0.50

Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1250

Supply pump  
pressure  
difference bar: 0,60...1,00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 2100  
TD travel mm: 5,30...6,00  
mm: (5,00...6,40)

electromagnet Volt: 12  
2nd speed 1/min: 1700  
TD travel mm: 5,20...6,00  
mm: (4,90...6,30)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 2,80...3,20  
mm: (2,30...3,70)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
TD travel mm: 0,30...1,10  
mm: (0,00...1,40)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 3.80...4.40

Shutoff  
electromagnet Volt: 12

2nd speed 1/min: 1250

Supply-pump  
pressure bar: 5.70...6.30

Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 2100

Supply-pump  
pressure bar: 8.10...8.70

Shutoff  
electromagnet Volt: 12

electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12

Overflow : 41.70...83.40  
quantity cm3/10s: (27.80...97.30)

2nd speed 1/min: 2100

Shutoff  
electromagnet Volt: 12

electromagnet Volt: 12

Overflow : 55.60...138.90  
quantity cm3/10s: (41.70...152.90)

Delivery-quant. and breakaway char.:

3rd speed 1/min: 2600

Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 0.00...6.00  
1000S.: (0.00...6.00)

5th speed 1/min: 2400

Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 10.00...14.00  
1000S.: (8.00...16.00)

8th speed 1/min: 2300

Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 17.00...27.00  
1000S.: (16.00...28.00)

9th speed 1/min: 2100

Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 30.00...32.00  
1000S.: (28.80...33.20)

12th speed 1/min: 1250

Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 35,50...36,50  
1000S.: (33.80...38.20)

20th speed 1/min: 600

Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 31.50...34.50  
1000S.: (30.00...36.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 415  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 415  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 7.00...9.00  
1000S.: (4.00...12.00)

Residual:

1.Rotacao 1/min: 540

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.00...3.00  
1000S.: (0.50...4.50)

2nd speed 1/min: 490  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.30...4.30  
1000S.: (0.80...5.80)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

3rd speed 1/min: 1500  
Inj.-qty. cm3/: 7.00...13.00  
difference 1000S.: (6.00...14.00)  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1500  
Inj.-qty. cm3/: 2.00...8.00  
difference 1000S.: (2.00...8.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : 0.30...0.50  
difference mm: (0.30...0.50)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
TD-travel : 1.00...1.40  
difference mm: (0.60...1.80)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Supply pump-  
pressure : 0.80...1.20  
difference bar: (0.60...1.40)

Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...85.00  
1000S.: (35.00...85.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 17.00...37.00  
1000S.: (17.00...37.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 35.00...85.00  
1000S.: (35.00...85.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: K-OT  
MS mm: 1.2...1.6  
SVS max. mm: 2,4

Remarks:

:  
:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 1,8 D  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2400R299-1  
Type number : 0 460 494 257  
Customer Part-No. :

Customer-specific information  
Customer : FORD

Engine : 1,8l IDI Swiss E

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.0

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 0,8  
mm: ±0,02(0,06)

Outlet : B

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Setting value mm: 4.90...5.30

AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Setting value bar: 6.30...6.90

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1750  
Del. quantity cm<sup>3</sup>/  
1000S.: 27.10...27.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 2.0  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm<sup>3</sup>/  
1000S.: 10,0...14.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2,5  
1000S.: (4,0)

Residual-Delivery Setting

Speed 1/min: 530  
Del. quantity cm<sup>3</sup>/  
1000S.: 1.00...5.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2675  
Del. quantity cm<sup>3</sup>/  
1000S.: 8.00...14.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
 Del. quantity cm3/: 53.00...73.00  
 mind 1000S.: 53.00  
 KSB/AFB  
 Valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

Speed 1/min: 1200  
 Inj.-qty. cm3/  
 difference 1000S.: 3.50...11.50  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1200  
 TD-travel  
 difference mm: 0.50...0.70  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1200  
 Supply pump  
 pressure  
 difference bar: 0,10...0,30  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
 TD travel mm: 7.70...8.50  
 mm: (7.40...8.80)  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1500  
 TD travel mm: 4.90...5.30  
 mm: (4.60...5.60)  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 800  
 TD travel mm: 0.80...1.60  
 mm: (0.50...1.90)

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 8th speed 1/min: 1000  
 TD travel mm: 2.80...5,20 B  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12  
 9th speed 1/min: 400  
 TD travel mm: 3.40...3.60 A  
 mm: (2.70...4.30) A  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
 Supply-pump  
 pressure bar: 4.20...4.80  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1500  
 Supply-pump  
 pressure bar: 6.30...6.90  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2000  
 Supply-pump  
 pressure bar: 7.50...8.10  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 2400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

3rd speed 1/min: 2950  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...2.00  
 1000S.: (0.00...2.00)  
 5th speed 1/min: 2675  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 8.00...14.00  
 1000S.: (6.50...15.50)  
 8th speed 1/min: 2550  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 18.00...26.00  
 1000S.: (16.00...28.00)  
 9th speed 1/min: 2400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 25.50...27.50  
 1000S.: (24.50...28.50)  
 11th speed 1/min: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 24.70...27.70  
 1000S.: (23.90...28.50)  
 12th speed 1/min: 1750  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 27.10...27.50  
 1000S.: (25.60...29.00)  
 20th speed 1/min: 750  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 25.20...28.20  
 1000S.: (24.40...29.00)  
 Mech. shutoff:  
 Electr. shutoff:  
 1st speed 1/min: 425  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

Damper set qty.:

LFG-setting:  
 solidale con carcassa:  
 Idle delivery:

1st speed 1/min: 425  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...14.00  
 1000S.: (6.40...17.60)

High Idle:

1st speed 1/mi: 590  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 7.00...11.00  
 1000S.: (3.40...14.60)

Residual:

1.Rotacao 1/min: 530  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 1.00...5.00  
 1000S.: (0.20...5.80)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1200  
 Inj.-qty. cm<sup>3</sup>/ : 5.00...7.00  
 difference 1000S.: (5.00...7.00)  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1200  
 Inj.-qty. cm<sup>3</sup>/: 3.50...11.50  
 difference 1000S.: (3.50...11.50)  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1200  
 Inj.-qty. cm<sup>3</sup>/: 2.00...8.00  
 difference 1000S.: (2.00...8.00)  
 KSB/AFB  
 valve Volt: 12

Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1200  
TD-travel : 0.50...0.70  
difference mm: (0.50...0.70)  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
TD-travel : 0.50...1.30  
difference mm: (0.50...1.30)  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1200  
Supply pump-  
pressure : 0.10...0.30  
difference bar: (0.10...0.30)  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)

1st speed 1/min: 1200  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 11.30...12.30  
1000S.: (9.30...14.30)

Automatic starting fuel delivery:

1st speed 1/min: 275  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 60.00...90.00  
1000S.: (60.00...90.00)

2nd speed 1/min: 500  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 28.00...40.00  
1000S.: (28.00...40.00)

4th speed 1/min: 100  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 53.00...73.00  
1000S.: (51.00...75.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,3...5,7  
MS mm: 1,5...1,9

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW 1,6 X17  
Edition : 18.02.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2250R328-5  
Type number : 0 460 494 267  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 086T-1.6 LLK

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 750  
Setting value mm: 3.00...3.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 750  
Setting value bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 750  
Del. quantity cm3/  
1000s.: 42.00...43.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000s.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000s.: 26.50...27.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 465  
Del. quantity cm3/  
1000s.: 12.00...14.00

Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm3/: 2.5  
1000s.: (3.0)

Residual-Delivery Setting

Speed 1/min: 615  
Del. quantity cm3/  
1000s.: 4.00...5.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2525  
Charge press hPa: 750  
Del. quantity cm3/  
1000s.: 13.00...17.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...85.00  
mind 1000s.: 35.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: -  
Inj.-qty. cm<sup>3</sup>/  
difference 1000s.: 9.00...13.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
Charge press hPa: -  
TD-travel  
difference mm: 0,60...0.80  
Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1250  
Charge press hPa: -  
Supply pump  
pressure  
difference bar: 0,10...0,30  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
Charge press hPa: 750  
TD travel mm: 6.40...7.20  
mm: (6.10...7.50)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press hPa: 750  
TD travel mm: 3.00...3.40  
mm: (2.50...3.90)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
Charge press hPa: 750  
TD travel mm: 1.70...2.50  
mm: (1.40...2.80)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 2250  
Charge press. hPa: 750  
TD travel mm: 7.00...7.80  
mm: (6.70...8.10)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 700

Charge press. hPa: 750  
Supply-pump  
pressure bar: 3.30...3.90  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2250  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 7.70...8.30  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (27.80...97.30)  
2nd speed 1/min: 2250  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...138.90  
quantity cm<sup>3</sup>/10s: (41.70...153.90)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 900  
Charge-air pressure-setting  
point hPa: 300  
LDA-stroke mm: 5.5  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.00...34.00  
1000s.: (30.50...36.50)  
2nd speed 1/min: 2650  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000s.: (0.00...6.00)  
5th speed 1/min: 2525  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000s.: (11.00...19.00)  
8th speed 1/min: 2425  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 26.50...36.50  
 1000S.: (25.50...37.50)  
 9th speed 1/min: 2250  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 36.30...38.30  
 1000S.: (35.10...39.50)  
 10th speed 1/min: 1500  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 11th speed 1/min: 900  
 Charge press. hPa: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 33.00...34.00  
 1000S.: (30.50...36.50)  
 12th speed 1/min: 1500  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 42.00...43.00  
 1000S.: (40.30...44.70)  
 13th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 26.00...31.00  
 1000S.: (23.50...33.50)  
 14th speed 1/min: 400  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 29.50...35.5  
 1000S.: (27.00...38.00)  
 15th speed 1/min: 700  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 26.50...27.50  
 1000S.: (24.00...30.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 465  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

Damper set qty.:

LFG-setting:  
 solidale con carcassa:  
 Idle delivery:

1st speed 1/min: 465

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 12.00...14.00  
 1000S.: (7.50...18.50)

High Idle:

1st speed 1/mi: 515  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 12.00...14.00  
 1000S.: (8.00...18.00)

Residual:

1. Rotacao 1/min: 615  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 4.00...5.00  
 1000S.: (1.50...7.50)  
 2nd speed 1/min: 565  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 6.00...8.00  
 1000S.: (3.50...10.50)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
 Charge press. hPa: -  
 Inj.-qty. cm<sup>3</sup>/: 7.00...9.00  
 difference 1000S.: (8.00...8.00)  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1250  
 Charge press. hPa: -  
 Inj.-qty. cm<sup>3</sup>/: 9.00...13.00  
 difference 1000S.: (7.00...15.00)  
 Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1250  
 Charge press. hPa: -  
 Inj.-qty. cm<sup>3</sup>/: 2.00...8.00  
 difference 1000S.: (2.00...8.00)  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Charge press. hPa: -  
 TD-travel : 0.60...0.80  
 difference mm: -  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1250  
 Charge press. hPa: -  
 TD-travel : 0.90...1.30  
 difference mm: (0.60...1.60)  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:

pompa di mandata (FP):

1st speed 1/min: 1250

Charge press. hPa: -

Supply pump-

pressure : 0.10...0.30

difference bar: (0.20...0.20)

Shutoff

electromagnet Volt: 12

4th speed 1/min: 1250

Charge press. hPa: -

Supply pump-

pressure : 0.60...1.00

difference bar: (0.40...1.20)

Shutoff

electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 200

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 35.00...85.00

1000S.: (35.00...85.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 35.00...85.00

1000S.: (35.00...85.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: K1

KF mm: 5.6...6.0

MS mm: 1.2...1.6

SVS max. mm: 3.1

LDA stroke mm: 5.5

XK mm: 17.0...19.0

XL mm: 10.3...13.7

Remarks:

:  
:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,3 K  
Edition : 12.04.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 074 892  
  
Injection pump  
Pump designation : PES4M55C32ORS167  
EP type number : 0 410 054 960  
Governor  
Governor design. : RSF360/1900M70-7  
Governor no. : 0 420 021 153

Customer spec. information  
Customer : MB-NFZ

Engine : OM601-D23 A,S,CH

1st version kW : 58.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 3- 4- 2

M18

Phasing : 0-90-180-270  
Tolerance + - ° : 0.00 (1.00)  
Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000  
Rack travel in mm : 12.80...12.90  
Del. quantity cm<sup>3</sup>/ : 4.0...4.1  
100 s : (3.9...4.2)  
Spread cm<sup>3</sup> : 0.2  
100 s : (0.3)

2nd speed rpm : 335.0  
Rack travel in mm : 5.1...5.3  
Del. quantity cm<sup>3</sup>/ : 0.5...0.6  
100 s : (0.4...0.9)  
Spread cm<sup>3</sup> : 0.1  
100 s : (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h : 1100  
Del. quantity : 40.0...41.0  
1000 : (39.0...42.0)  
Spread cm<sup>3</sup> : 2.50  
1000 : (3.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 50...0  
3rd rack travel in: 7,0...7,5  
Speed rpm : 2100  
4th rack travel in: 2500  
Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000  
Rack travel in mm : 1,4...1,5

LOW IDLE 1  
Control lever  
position degrees: 11...15  
Setting point w/out bumper spring

Testing:

```
Speed      rpm      : 250
Minimum rack travel: 7.50
Speed      rpm      : 335
Rack travel in mm  : 5.10...5.30
Rack travel in mm  : 2.50
Speed      rpm      : 550...650
Speed      rpm      : 1000
Maximum rack travel: 1.50
```

SET IDLE AUXILIARY SPRING

```
Speed      rpm      : 400
Rack travel in mm : 3,9...4,1
                : (3,8...4,2)
```

## TORQUE CONTROL

```
Torque control curve - 1st version
1st speed  rpm   : 1000
  Rack travel in m: 12.80...12.90
2nd speed  rpm   : 1400
  Rack travel in m: 12.20...12.50
3rd speed  rpm   : 1900
  Rack travel in m: 11.40...11.70
4th speed  rpm   : 500
  Rack travel in m: 12.00...12.30 *
5th speed  rpm   : 800
  Rack travel in m: 12.40...12.70**
```

## Aneroid/Altitude Compensator Test

1st version

```
Setting
Speed      rpm      : 1000
Pressure   hPa      : 950
Rack travel mm    : 0.00...0.20
```

## Measurement

Speed 1/min : 1000

```
1st pressure hPa : 900
  Rack travel in m: 0.50...0.70
2nd pressure hPa : 750
  Rack travel in m: 1.80...2.20
```

## FUEL DELIVERY CHARACTERISTICS

1st version

```

Aneroid pressure h: 1100
Speed          rpm  : 1400
Del.quantity   cm3/ : 39.5...41.0
                1000 s: (38.5...42.0)
Spread         cm3  : 2.50
                1000 s: (3.0)
Aneroid pressure h: 1100

```

```
Speed rpm : 1900
Del.quantity cm3/ : 39.5...41.5
1000 s: (38.5...42.5)
Spread cm3 : 2.50
1000 s: (3.00)
Aneroid pressure h: 1100
Speed rpm : 500
Del.quantity cm3/ : 34.5...36.0 *
1000 s: (33.5...37.0) *
Spread cm3 : 2.50
1000 s: (3.00)
Aneroid pressure h: 1100
Speed rpm : 800
Del.quantity cm3/ : 37.5...39.0 **
1000 s: (36.5...40.0)**
Spread cm3 : 2.50
1000 s: (3.00)
```

STARTING FUEL DELIVERY

```
Speed          rpm      : 100
Del.quantity   cm3/     : 52.0...0.0
               1000 s : (52.0...0.0)
Rack travel in mm : 20.10...0.00
```

HIGH IDLE

```

1st version
Aneroid pressure h: 1100
Speed          rpm   : 2100
Rack travel in mm : 7.00...7.50
Del.quantity cm3/  : 22.0...26.0
                  1000 s: (21.0...27.0)
Spread         cm3   : 2.50
                  1000 s: (3.00)

```

LOW IDLE

```
Speed      rpm      : 335
Rack travel in mm : 5.10...5.30
Del.quantity cm3/  : 5.0...6.0
              1000 s: (4.5...9.0)
Spread     cm3      : 1.00
              1000 s: (1.50)
```

## SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

```
Control lever at idle stop
Speed          rpm      : 360
Rack travel in mm : (12,3...13,7)
Del.quantity cm3/  : -
                1000 s : (33,0...41,0)
Current A       : 1,8
Control lever at full-load stop
Speed          rpm      : 2500
Rack travel in mm : 0,0...1,0
```

Current

short-duration A : 3,0

Starting test

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : -

min. 1000 s: 52,0 / 1,8A

Remarks:

Pin projection = 16.60...16.70 mm

Sliding sleeve pre-travel = 6.25 mm

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With n = 335 1/min. and pu = 450 mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 15.3°...15.7°  
(15.2...15.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

\* Setting point for negative torque  
control - negative retainer behind  
sliding sleeve

\*\* Reference measurement:  
Control-rod travel and delivery too  
large - position spiral spring  
downwards  
Control-rod travel and delivery too  
small - position spiral spring upwards

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,3 L  
Edition : 12.04.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 074 893  
Injection pump  
Pump designation : PES4M55C320RS167  
EP type number : 0 410 054 960  
Governor  
Governor design. : RSF360/2000M70-6  
Governor no. : 0 420 021 152

Customer-spec. information  
Customer : MB-NFZ

Engine : OM601-D23 A,S,CH

1st version kW : 60.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 3- 4- 2

M21

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.80...12.90

Del.quantity cm<sup>3</sup>/ : 4.0...4.1

100 s: (3.9...4.2)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 335.0

Rack travel in mm : 5.1...5.3

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 40.0...41.0

1000 : (39.0...42.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,0...7,5

Speed rpm : 2200

4th rack travel in: 2500

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

LOW IDLE 1

Control lever

position degrees: 11...15

Setting point w/out bumper spring

Speed rpm : 335  
Rack travel in mm : 5.2

#### Testing:

Speed rpm : 250  
Minimum rack travel: 7.50  
Speed rpm : 335  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.50  
Speed rpm : 550...650  
Speed rpm : 1000  
Maximum rack travel: 1.50

#### SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 3,9...4,1  
: (3,8...4,2)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 1400  
Rack travel in m: 12.20...12.50  
3rd speed rpm : 2000  
Rack travel in m: 11.40...11.70  
4th speed rpm : 500 \*  
Rack travel in m: 12.00...12.30 \*  
5th speed rpm : 800\*\*  
Rack travel in m: 12.40...12.70\*\*

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1400  
Del.quantity cm<sup>3</sup>/ : 39.5...41.0  
1000 s: (38.5...42.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1100

Speed rpm : 2000  
Del.quantity cm<sup>3</sup>/ : 39.5...41.5  
1000 s: (38.5...42.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 500 \*  
Del.quantity cm<sup>3</sup>/ : 34.5...36.0 \*  
1000 s: (33.5...37.0) \*  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 800\*\*  
Del.quantity cm<sup>3</sup>/ : 37.5...39.0 \*\*  
1000 s: (36.5...40.0)\*\*  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 2200  
Rack travel in mm : 7.00...7.50  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 335  
Rack travel in mm : 5.10...5.30  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
1000 s: (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 360  
Rack travel in mm : (12,3...13,7)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (33,0...41,0)  
Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2500  
Rack travel in mm : 0,0...1,0

Current

short-duration A : 3,0

Starting test

Speed rpm : 100

Del. quantity cm<sup>3</sup>/ : -

min. 1000 s: 52,0 / 1,8A

Remarks:

Pin projection = 16.60...16.70 mm

Sliding sleeve pre-travel = 6.25 mm

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With  $n = 335$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:

adjustment and blocking with device

KDEP 1077 =  $15.3^\circ \dots 15.7^\circ$

( $15.2 \dots 15.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

\* Setting point for negative torque  
control - negative retainer behind  
sliding sleeve

\*\* Reference measurement:

Control-rod travel and delivery too  
large - position spiral spring  
downwards

Control-rod travel and delivery too  
small - position spiral spring upwards

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,3 M  
Edition : 12.04.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 074 894  
Injection pump  
Pump designation : PES4M55C320RS167  
EP type number : 0 410 054 960  
Governor  
Governor design. : RSF375/1900M69-6  
Governor no. : 0 420 021 150

Customer-spec. information  
Customer : MB-NFZ

Engine : OM601-D23 A,S,CH

1st version kW : 58.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 3- 4- 2

M24

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 4.0...4.1

100 s: (3.9...4.2)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 375.0

Rack travel in mm : 5.0...5.2

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 40.0...41.0

1000 : (39.0...42.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,0...7,5

Speed rpm : 2100

4th rack travel in: 2500

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 11...15

Setting point w/out bumper spring

Speed rpm : 375  
Rack travel in mm : 5.1

#### Testing:

Speed rpm : 250  
Minimum rack travel: 10.20  
Speed rpm : 375  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 3.00  
Speed rpm : 450...550  
Speed rpm : 1000  
Maximum rack travel: 1.50

#### SET IDLE AUXILIARY SPRING

Speed rpm : 420  
Rack travel in mm : 3,9...4,1  
: (3,8...4,2)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 1400  
Rack travel in m: 12.20...12.50  
3rd speed rpm : 1900  
Rack travel in m: 11.40...11.70  
4th speed rpm : 500 \*  
Rack travel in m: 12.00...12.30 \*  
5th speed rpm : 800\*\*  
Rack travel in m: 12.40...12.70\*\*

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

##### Measurement

Speed 1/min : 1000

1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1400  
Del.quantity cm<sup>3</sup>/ : 39.5...41.0  
1000 s: (38.5...42.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1100

M25

Speed rpm : 1900  
Del.quantity cm<sup>3</sup>/ : 39.5...41.5  
1000 s: (38.5...42.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 500 \*  
Del.quantity cm<sup>3</sup>/ : 34.5...36.0 \*  
1000 s: (33.5...37.0)\*  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 800\*\*  
Del.quantity cm<sup>3</sup>/ : 37.5...39.0 \*\*  
1000 s: (36.5...40.0)\*\*  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

##### 1st version

Aneroid pressure h: 1100  
Speed rpm : 2100  
Rack travel in mm : 7.00...7.50  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 375  
Rack travel in mm : 5.00...5.20  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
1000 s: (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING PNEUMATIC FAST IDLE (ELA)

Speed rpm : 425  
Rack travel in mm : 6,6...8,2  
Del.quantity cm<sup>3</sup>/ : 11,5...19,5  
1000 s: -  
Vacuum hPa : 400

Remarks:

:



Sliding sleeve pre-travel = 6.25 mm

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With  $n = 375$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

Start-of-delivery sensor system:  
adjustment and blocking with device  
 $KDEP 1077 = 15.3^\circ \dots 15.7^\circ$   
( $15.2 \dots 15.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

\* Setting point for negative torque  
control - negative retainer behind  
sliding sleeve

\*\* Reference measurement:  
Control-rod travel and delivery too  
large - position spiral spring  
downwards  
Control-rod travel and delivery too  
small - position spiral spring upwards

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,4 V10  
Edition : 22.03.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 074 896  
  
Injection pump  
Pump designation : PES4M55C320RS110  
EP type number : 0 410 054 956  
Governor  
Governor design. : RSF375/2200M21  
Governor no. : 0 420 021 148

Customer-spec. information  
Customer : MB-NFZ

Engine : OM616 2.4L ADA  
1st version kW : 55.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 012

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
                  : (1.65...1.85)  
Rack travel in mm : 20.00...0.00  
Firing order : 1- 3- 4- 2

M27

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 3.6...3.7

100 s: (3.5...3.8)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 375.0

Rack travel in mm : 6.1...6.3

Del.quantity cm3/ : 0.6...0.7

100 s: (0.5...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 36.0...37.0

1000 : (35.0...38.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,8...8,2

Speed rpm : 2350

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 375

Rack travel in mm : 6.2

```

Speed          rpm      : 250
Minimum rack trave: 10.00
Speed          rpm      : 375
Rack travel in mm : 6.10...6.30
Rack travel in mm : 2.00
Speed          rpm      : 700...800
Speed          rpm      : 1000
Maximum rack trave: 1.50

```

Speed rpm : 450  
Rack travel in mm : 5,1...5,3  
                              : (5,0...5,4)

```
Torque control curve - 1st version
1st speed   rpm   : 1000
  Rack travel in m: 12.60...12.70
2nd speed   rpm   : 1700
  Rack travel in m: 12.20...12.40
3rd speed   rpm   : 2100
  Rack travel in m: 11.80...12.00
```

## Aneroid/Altitude Compensator Test

```
1st version
Setting
Speed      rpm      : 1000
Pressure   hPa      : 950
Rack travel mm    : 0.00...0.20
```

## Measurement

Speed 1/min : 1000

```
1st pressure hPa : 900
  Rack travel in m: 0.50...0.70
2nd pressure hPa : 750
  Rack travel in m: 1.80...2.20
```

## FUEL DELIVERY CHARACTERISTICS

```

1st version
Aneroid pressure h: 1100
Speed rpm : 1700
Del.quantity cm3/ : 38.0...40.0
1000 s: (37.0...41.0)
Spread cm3 : 2.50
1000 s: (3.)
Aneroid pressure h: 1100
Speed rpm : 2100
Del.quantity cm3/ : 37.0...39.0
1000 s: (36.0...40.0)
Spread cm3 : 2.50
1000 s: (3.00)

```

STARTING FUEL DELIVERY

```
Speed      rpm      : 100
Del.quantity cm3/    : 52.0...0.0
              1000 s: (52.0...0.0)
Rack travel in mm : 20.10...0.00
```

HIGH IDLE

```

1st version
Aneroid pressure h: 1100
Speed          rpm : 2350
Rack travel in mm : 7.80...8.20
Del.quantity cm3/ : 18.0...22.0
                1000 s: (17.0...23.0)
Spread         cm3 : 2.50
                1000 s: (3.00)

```

LOW IDLE

```
Speed      rpm      : 375
Rack travel in mm : 6.10...6.30
Del.quantity cm3/  : 6.0...7.0
              1000 s: (5.5...9.0)
Spread     cm3      : 1.00
              1000 s: (1.50)
```

## Remarks:

Sliding sleeve pre-travel = 6.0 mm

## CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

## TESTING PNEUMATIC SHUTOFF DEVICE

With  $n = 375$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Pin projection = 16.60...16.70 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,0 r4  
Edition : 15.04.91  
Replaces : 17.02.89  
Test oil : ISO-4113  
  
Combination no. : 0 400 074 903  
  
Injection pump  
Pump designation : PES4M55C320RS169  
EP type number : 0 410 054 959  
Governor  
Governor design. : RSF36C/2300M60-9  
Governor no. : 0 420 021 109

Customer spec. information  
Customer : MB-PKW

Engine : OM601-ECE

1st version kW : 53.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 3- 4- 2

N01

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 3.2...3.3

100 s: (3.1...3.4)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 335.0

Rack travel in mm : 6.3...6.5

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 32.0...33.0

1000 : (31.0...34.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,5...8,9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,2...1,3

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 335  
Rack travel in mm : 6.4

#### Testing:

Speed rpm : 225  
Minimum rack travel: 9.00  
Speed rpm : 335  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 610...710  
Speed rpm : 1000  
Maximum rack travel: 1.30

#### SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 4,9...5,1

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 1800  
Rack travel in m: 11.70...11.90  
3rd speed rpm : 2200  
Rack travel in m: 11.40...11.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Pressure hPa : 950  
Rack travel mm : 0.00...0.20

1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
1000 s: (33.0...36.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.)  
Aneroid pressure h: 1100  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 34.0...36.0  
1000 s: (33.0...37.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 335  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
1000 s: (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop

Speed rpm : 360  
Rack travel in mm : (12,6...14,0)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (29,0...37,0)

Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0 / 1,8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

Pin projection = 16.60...16.70 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be

greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With  $n = 335$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

Start-of-delivery sensor system: adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,0 r5  
Edition : 15.04.91  
Replaces : 28.05.90  
Test oil : ISO-4113  
  
Combination no. : 0 400 074 904  
  
Injection pump  
Pump designation : PES4M55C320RS169  
EP type number : 0 410 054 959  
Governor  
Governor design. : RSF375/2300M56-6  
Governor no. : 0 420 021 110

Customer-spec. information  
Customer : MB-PKW

Engine : OM601-ECE

1st version kW : 53.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00  
Firing order : 1- 3- 4- 2

NO4

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 3.2...3.3

100 s: (3.1...3.4)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 375.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 32.0...33.0

1000 : (31.0...34.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,5...8,9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,2...1,3

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point: w/out bumper spring

### Testing:

```

Speed          rpm      : 250
Minimum rack   trave: 11.00
Speed          rpm      : 375
Rack travel    in mm    : 6.40...6.60
Rack travel    in mm    : 2.00
Speed          rpm      : 640...740
Speed          rpm      : 1000
Maximum rack   trave: 1.30

```

SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 5,3...5,5  
: (5,2...5,6)

## TORQUE CONTROL

```
Torque control curve - 1st version
1st speed   rpm   : 1000
  Rack travel in m: 12.30...12.40
2nd speed   rpm   : 1800
  Rack travel in m: 11.70...11.90
3rd speed   rpm   : 2200
  Rack travel in m: 11.40...11.60
```

## Aneroid/Altitude Compensator Test

```
1st version
Pressure      hPa   : 950
Rack travel   mm    : 0.00...0.20
```

```
1st pressure hPa : 900
  Rack travel in m: 0.50...0.70
2nd pressure hPa : 750
  Rack travel in m: 1.80...2.20
```

## FUEL DELIVERY CHARACTERISTICS

```

1st version
Aneroid pressure h: 1100
Speed rpm : 1800
Del.quantity cm3/ : 34.0...35.5
1000 s: (33.0...36.5)
Spread cm3 : 2.50
1000 s: (3.0)
Aneroid pressure h: 1100
Speed rpm : 2200
Del.quantity cm3/ : 34.0...36.0
1000 s: (33.0...37.0)
Spread cm3 : 2.50
1000 s: (3.00)

```

STARTING FUEL DELIVERY

**N05**

```
Speed          rpm      : 100
Del.quantity   cm3/     : 52.0...0.0
                1000 s: (52.0...0.0)
Rack travel    in mm    : 20.10...0.00
```

HIGH IDLE

```
1st version
Aneroid pressure h: 1100
Speed          rpm   : 2500
Rack travel in mm : 8.50...8.90
Del.quantity cm3/   : 22.0...26.0
                  1000 s: (21.0...27.0)
Spread         cm3   : 2.50
                  1000 s: (3.00)
```

LOW IDLE

```
Speed      rpm      : 375
Rack travel mm : 6.40...6.60
Del.quantity cm3/ : 5.0...6.0
            1000 s : (4.5...9.0)
Spread     cm3      : 1.00
            1000 s : (1.50)
```

## SETTING PNEUMATIC FAST IDLE (ELA)

Speed rpm : 425  
Rack travel in mm : 8,1...9,7  
Del.quantity cm3/ : 12,0...20,0  
1000 s : -  
Vacuum hPa : 400

Remarks:

Sliding sleeve pre-travel = 6.5 mm

Pin projection = 16.60...16.70 mm

## CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

# TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 375$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to



control-rod travel = 0 mm

Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,9 G  
Edition : 15.04.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 075 931  
  
Injection pump  
Pump designation : PES5M55C320RS168  
EP type number : 0 410 055 978  
Governor  
Governor design. : RSF340/2000M70-8  
Governor no. : 0 420 021 154

Customer-spec. information  
Customer : MB-NFZ

Engine : OM602-D29 A,S,CH

1st version kW : 72.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

N07

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 3.8...3.9

100 s: (3.7...4.0)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 38.0...39.0

1000 : (37.0...40.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,0...7,5

Speed rpm : 2200

4th rack travel in: 2500

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

```
Control lever at idle stop
Speed      rpm      : 340
Rack travel in mm : (11,6...13,0)
Del.quantity cm3/  : -
              1000 s: (29.0...37,0)
Current A    : 1,8
Control lever at full-load stop
Speed      rpm      : 2500
Rack travel in mm : 0,0...1,0
```

Current

short-duration A : 3,0

Starting test

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : -

min. 1000 s: 52,0 / 1,8A

Remarks:

Pin projection = 16.60...16.70 mm

Sliding sleeve pre-travel = 6.25 mm

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With  $n = 315$  1/min. and  $p_u = 450$  mbar,

control rod must move quickly to

control-rod travel = 0 mm

Start-of-delivery sensor system:

adjustment and blocking with device

KDEP 1077 = 15.3°...15.7°

(15.2...15.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between

max. and min. value = max. 1° angular  
displacement of cam

\* Setting point for negative torque  
control - negative retainer behind  
sliding sleeve

\*\* Reference measurement:

Control-rod travel and delivery too

large - position spiral spring

downwards

Control-rod travel and delivery too

small - position spiral spring upwards

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,9 G1  
Edition : 15.04.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 075 932  
Injection pump  
Pump designation : PES5M55C32GRS168  
EP type number : 0 410 055 978  
Governor  
Governor design. : RSF340/1900M70-9  
Governor no. : 0 420 021 155

Customer-spec. information  
Customer : MB-NFZ

Engine : OM602-D29 A,S,CH

1st version kW : 70.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 2- 4- 5- 3

M10

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 3.8...3.9

100 s: (3.7...4.0)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 38.0...39.0

1000 : (37.0...40.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,0...7,5

Speed rpm : 2100

4th rack travel in: 2500

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER

### POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring



Current

short-duration A : 3,0

Starting test

Speed rpm : 100

Del. quantity cm<sup>3</sup>/ : -

min. 1000 s: 52,0 / 1,8A

Remarks:

Pin projection = 16.60...16.70 mm

Sliding sleeve pre-travel = 6.25 mm

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:

adjustment and blocking with device

KDEP 1077 =  $15.3^\circ \dots 15.7^\circ$

( $15.2 \dots 15.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

\* Setting point for negative torque  
control - negative retainer behind  
sliding sleeve

\*\* Reference measurement:

Control-rod travel and delivery too  
large - position spiral spring  
downwards

Control-rod travel and delivery too  
small - position spiral spring upwards

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,9 G2  
Edition : 15.04.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 075 933  
  
Injection pump  
Pump designation : PES5M55C320RS168  
EP type number : 0 410 055 978  
Governor  
Governor design. : RSF350/1900M69-7  
Governor no. : 0 420 021 151

Customer-spec. information  
Customer : MB-NFZ

Engine : OM602-D29 A,S,CH

1st version kW : 70.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

N13

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 3.8...3.9

100 s: (3.7...4.0)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 38.0...39.0

1000 : (37.0...40.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7.0...7,5

Speed rpm : 2100

4th rack travel in: 2500

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring



Speed rpm : 350  
Rack travel in mm : 5.3

#### Testing:

Speed rpm : 250  
Minimum rack travel: 9.20  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 3.00  
Speed rpm : 470...570  
Speed rpm : 1000  
Maximum rack travel: 1.50

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,2...4,4  
: (4,1...4,5)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 1400  
Rack travel in m: 12.10...12.40  
3rd speed rpm : 1900  
Rack travel in m: 11.60...11.90  
4th speed rpm : 500 \*  
Rack travel in m: 12.20...12.40 \*  
5th speed rpm : 800\*\*  
Rack travel in m: 12.30...12.50\*\*

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1400  
Del.quantity cm3/ : 38.0...39.5  
1000 s: (37.0...40.5)  
Spread cm3 : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1100

Speed rpm : 1900  
Del.quantity cm3/ : 39.5...41.5  
1000 s: (38.5...42.5)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 500 \*  
Del.quantity cm3/ : 34.5...36.0 \*  
1000 s: (33.5...37.0) \*  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 800\*\*  
Del.quantity cm3/ : 36.5...38.0 \*\*  
1000 s: (35.5...39.0)\*\*  
Spread cm3 : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 2100  
Rack travel in mm : 7.00...7.50  
Del.quantity cm3/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del.quantity cm3/ : 5.0...6.0  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING PNEUMATIC FAST IDLE (ELA)

Speed rpm : 400  
Rack travel in mm : 5,2...6,8  
Del.quantity cm3/ : 5,0...13,0  
1000 s: -  
Vacuum hPa : 400

Remarks:

Pin projection = 16.60...16.70 mm

Sliding sleeve pre-travel = 6.25 mm

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 350$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
 $KDEP 1077 = 15.3^\circ \dots 15.7^\circ$   
( $15.2 \dots 15.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

\* Setting point for negative torque  
control - negative retainer behind  
sliding sleeve

\*\* Reference measurement:  
Control-rod travel and delivery too  
large - position spiral spring  
downwards  
Control-rod travel and delivery too  
small - position spiral spring upwards

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 C5  
 Edition : 15.04.91  
 Replaces : 13.11.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 940  
 Injection pump  
 Pump designation : PES5M55C320RS173  
 EP type number : 0 410 055 976  
 Governor  
 Governor design. : RSF340/2300M60-26  
 Governor no. : 0 420 021 133

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602-Abgl. MJ90

1st version kW : 64.0

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)  
 Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9,1...9,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Testing:

```
Speed          rpm : 220
Minimum rack   trave: 8.00
Speed          rpm : 315
Rack travel in mm : 6.40...6.60
Rack travel in mm : 2.50
Speed          rpm : 600...700
Speed          rpm : 1000
Maximum rack   trave: 1.50
```

SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 5,2...5,4  
: (5,1...5,5)

## TORQUE CONTROL

```
Torque control curve - 1st version
1st speed   rpm   : 1000
  Rack travel in m: 12.40...12.50
2nd speed   rpm   : 1800
  Rack travel in m: 11.80...12.00
3rd speed   rpm   : 2200
  Rack travel in m: 11.50...11.70
```

## Aneroid/Altitude Compensator Test

1st version

```
Setting
Speed      rpm      : 1000
Pressure   hPa      : 950
Rack travel mm    : 0.00...0.20
```

## Measurement

Speed 1/min : 1000

```
1st pressure hPa : 900
  Rack travel in m: 0.50...0.70
2nd pressure hPa : 750
  Rack travel in m: 1.80...2.20
```

## FUEL DELIVERY CHARACTERISTICS

1st version

```

Aneroid pressure h: 1100
Speed      rpm      : 1800
Del.quantity cm3/    : 34.5...36.0
              1000 s: (33.5...37.0)
Spread      cm3      : 2.50
              1000 s: (3.0)
Aneroid pressure h: 1100
Speed      rpm      : 2200
Del.quantity cm3/    : 33.0...35.0
              1000 s: (32.0...36.0)

```

Spread      cm<sup>3</sup> : 2.50  
                 1000 s: (3.00)

STARTING FUEL DELIVERY

```
Speed          rpm      : 100
Del.quantity   cm3/      : 52.0...0.0
                1000 s : (52.0...0.0)
Rack travel in mm : 20.10...0.00
```

HIGH IDLE

```

1st version
Aneroid pressure h: 1100
Speed          rpm   : 2500
Rack travel in mm : 9.10...9.50
Del.quantity cm3/   : 22.0...26.0
                  1000 s: (21.0...27.0)
Spread         cm3   : 2.50
                  1000 s: (3.00)

```

LOW IDLE

```
Speed      rpm      : 315
Rack travel in mm : 6.40...6.60
Del.quantity cm3/  : 5.0...6.0
              1000 s: (4.5...9.0)
Spread     cm3      : 1.00
              1000 s: (1.50)
```

## SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

```
Control lever at idle stop
Speed          rpm      : 340
Rack travel in mm : (13,0...14,4)
Del.quantity cm3/  : -
                  1000 s: (29,0...37,0)
Current A       : 1,8
Control lever at full-load stop
Speed          rpm      : 2950
Rack travel in mm : 0,0...1,0
Current
  short-duration A : 3,0
Starting test
Speed          rpm      : 100
Del.quantity cm3/  : -
min.           1000 s: 52,0 / 1,8 A
```

## Remarks:

Pin projection = 16.60...16.70 mm

Sliding sleeve pre-travel = 6.5 mm

## CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
 $KDEP\ 1077 = 17.3^\circ \dots 17.7^\circ$   
( $17.2 \dots 17.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 C8  
Edition : 15.04.91  
Replaces : 13.11.89  
Test oil : ISO-4113  
  
Combination no. : 0 400 075 941  
  
Injection pump  
Pump designation : PES5M55C32ORS173  
EP type number : 0 410 055 976  
Governor  
Governor design. : RSF350/2300M56-11  
Governor no. : 0 420 021 131

Customer-spec. information  
Customer : MB-PKW

Engine : OM602-Abgl. MJ90

1st version kW : 64.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
: (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9,1...9,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

### Testing:

```
Speed          rpm      : 220
Minimum rack travel: 10.00
Speed          rpm      : 350
Rack travel in mm : 6.40...6.60
Rack travel in mm : 2.50
Speed          rpm      : 600...700
Speed          rpm      : 1000
Maximum rack travel: 1.50
```

SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 5,2...5,4  
: (5,1...5,5)

## TORQUE CONTROL

```
Torque control curve - 1st version
1st speed   rpm   : 1000
  Rack travel in m: 12.40...12.50
2nd speed   rpm   : 1800
  Rack travel in m: 11.80...12.00
3rd speed   rpm   : 2200
  Rack travel in m: 11.50...11.70
```

## Aneroid/Altitude Compensator Test

1st version

```
Setting
Speed      rpm      : 1000
Pressure   hPa       : 950
Rack travel mm    : 0.00...0.20
```

## Measurement

```
Speed      1/min : 1000
1st pressure hPa : 900
  Rack travel in m: 0.50...0.70
2nd pressure hPa : 750
  Rack travel in m: 1.80...2.20
```

## FUEL DELIVERY CHARACTERISTICS

1st version

```

Aneroid pressure h: 1100
Speed          rpm   : 1800
Del.quantity   cm3/   : 34.5...36.0
                  1000 s: (33.5...37.0)
Spread         cm3    : 2.50
                  1000 s: (3.0)
Aneroid pressure h: 1100
Speed          rpm   : 2200
Del.quantity   cm3/   : 33.0...35.0
                  1000 s: (32.0...36.0)

```

Spread            cm<sup>3</sup> : 2.50  
                         1000 s: (3.00)

STARTING FUEL DELIVERY

```
Speed          rpm      : 100
Del.quantity   cm3/     : 52.0...0.0
               1000 s : (52.0...0.0)
Rack travel    in mm    : 20.10...0.00
```

HIGH IDLE

```

1st version
Aneroid pressure h: 1100
Speed          rpm   : 2500
Rack travel in mm : 9.10...9.50
Del.quantity cm3/   : 22.0...26.0
                  1000 s: (21.0...27.0)
Spread         cm3   : 2.50
                  1000 s: (3.00)

```

LOW IDLE

```
Speed      rpm      : 350
Rack travel in mm : 6.40...6.60
Del.quantity cm3/  : 5.0...6.0
              1000 s: (4.5...9.0)
Spread     cm3      : 1.00
              1000 s: (1.50)
```

SETTING PNEUMATIC FAST IDLE  
(ELA)

```
Speed      rpm      : 400
Rack travel in mm : (6,7...8,1)
Del.quantity cm3/  : -
              1000 s: (5,0...13,0)
Vacuum      hPa     : 400
```

## Remarks:

Pin projection = 16.60...16.70 mm

Sliding sleeve pre-travel = 6.5 mm

## CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 350 \text{ 1/min}$  and  $p_u = 450 \text{ mbar}$   
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $17.3^\circ \dots 17.7^\circ$   
( $17.2 \dots 17.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,9 D  
Edition : 15.04.91  
Replaces : 13.11.89  
Test oil : ISO-4113

Combination no. : 0 400 075 943

Injection pump  
Pump designation : PES5M55C320RS168  
EP type number : 0 410 055 978  
Governor  
Governor design. : RSF350/1700M69-5  
Governor no. : 0 420 021 147

Customer-spec. information  
Custom. : MB-NFZ

Engine : OM602-2.9L

1st version kW : 62.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

N22

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 3.6...3.7

100 s: (3.5...3.8)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 36.0...37.0

1000 : (35.0...38.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9,0...9,5

Speed rpm : 1800

4th rack travel in: 2300

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER

POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Testing:

```
Speed      rpm      : 250
Minimum rack trave: 9.20
Speed      rpm      : 350
Rack travel in mm : 5.50...5.70
Rack travel in mm : 3.00
Speed      rpm      : 520...620
Speed      rpm      : 1000
Maximum rack trave: 1.50
```

## SET IDLE AUXILIARY SPRING

```
Speed      rpm      : 380
Rack travel in mm : 4,4...4,6
                  : (4,3...4,7)
```

## TORQUE CONTROL

```

Torque control curve - 1st version
1st speed   rpm   : 1000
  Rack travel in m: 12.30...12.40
2nd speed   rpm   : 1400
  Rack travel in m: 11.60...11.90
3rd speed   rpm   : 1650
  Rack travel in m: 11.40...11.70
4th speed   rpm   : 500 *
  Rack travel in m: 11.90...12.20 *
5th speed   rpm   : 800**
  Rack travel in m: 12.10...12.40**

```

## Aneroid/Altitude Compensator Test

1st version

```
Setting
Speed      rpm      : 1000
Pressure    hPa      : 950
Rack travel mm : 0.00...0.20
```

## Measurement

Speed 1/min : 1000

```
1st pressure hPa : 900
  Rack travel in m: 0.50...0.70
2nd pressure hPa : 750
  Rack travel in m: 1.80...2.20
```

## FUEL DELIVERY CHARACTERISTICS

1st version

```

Aneroid pressure h: 1100
Speed          rpm  : 1400
Del.quantity   cm3/ : 36.0...37.5
                1000 s: (35.0...38.5)
Spread         cm3   : 2.50
                1000 s: (3.0)
Aneroid pressure h: 1100

```

N23

```
Speed      rpm      : 1650
Del.quantity cm3/    : 36.5...38.5
           1000 s: (35.5...39.5)
```

Spread  
cm<sup>3</sup> : 2.50  
1000 s: (3.00)

Aneroid pressure h: 1100  
Speed rpm : 500 \*  
Del.quantity cm3/ : 32.0...33.5 \*  
1000 s: (31.0...34.5)\*

Spread      cm3 : 2.50  
1000 s: (3.00)

Aneroid pressure h: 1100  
Speed rpm : 800\*\*  
Del.quantity cm3/ : 34.5...36.0 \*\*  
1000 s: (33.5...37.0)\*\*

Spread cm3 : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

```
Speed          rpm      : 100
Del.quantity   cm3/      : 52.0...0.0
                1000 s: (52.0...0.0)
Rack travel in mm : 20.10...0.00
```

HIGH IDLE

```

1st version
Aneroid pressure h: 1100
Speed          rpm   : 1800
Rack travel in mm : 9.00...9.50
Del.quantity cm3/   : 28.0...32.0
                  1000 s: (27.0...33.0)
Spread         cm3   : 2.50
                  1000 s: (3.00)

```

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.50...5.70  
Del.quantity cm3/ : 5.0...6.0  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

## SETTING PNEUMATIC FAST IDLE (ELA)

Speed rpm : 400  
 Rack travel in mm : 5,6...7,2  
 Del.quantity cm3/ : 5,0...13,0  
 1000 s : -  
 Vacuum hPa : 400

Remarks:

Pin projection = 16.60...16.70 mm

Sliding sleeve pre-travel = 6.25 mm

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 350$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
 $KDEP 1077 = 15.3^\circ \dots 15.7^\circ$   
( $15.2 \dots 15.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

\* Setting point for negative torque  
control - negative retainer behind  
sliding sleeve

\*\* Reference measurement:  
Control-rod travel and delivery too  
large - position spiral spring  
downwards  
Control-rod travel and delivery too  
small - position spiral spring upwards

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 D1  
Edition : 15.04.91  
Replaces : 13.11.89  
Test oil : ISO-4113

Combination no. : 0 400 075 947

Injection pump  
Pump designation : PES5M55C320RS168  
EP type number : 0 410 055 978  
Governor  
Governor design. : RSF340/1900M70-5  
Governor no. : 0 420 021 124

Customer-spec. information  
Customer : MB-NFZ

Engine : OM602-2.9L

1st version kW : 70.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

N25

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm<sup>3</sup>/ : 3.8...3.9

100 s: (3.7...4.0)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 38.0...39.0

1000 : (37.0...40.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control Lever

position degrees: 50...0

3rd rack travel in: 7,0...7,5

Speed rpm : 2100

4th rack travel in: 2500

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

### Testing:

```

Speed          rpm : 250
Minimum rack trave: 7.00
Speed          rpm : 315
Rack travel in mm : 5.30...5.50
Rack travel in mm : 2.50
Speed          rpm : 500...600
Speed          rpm : 1000
Maximum rack trave: 1.50

```

### SET IDLE AUXILIARY SPRING

```
Speed      rpm      : 380
Rack travel in mm : 4,0...4,2
                : (3,9...4,3)
```

## TORQUE CONTROL

```

Torque control curve - 1st version
1st speed  rpm   : 1000
  Rack travel in m: 12.50...12.60
2nd speed  rpm   : 1400
  Rack travel in m: 12.10...12.40
3rd speed  rpm   : 1900
  Rack travel in m: 11.60...11.90
4th speed  rpm   : 500 *
  Rack travel in m: 12.20...12.40 *
5th speed  rpm   : 800**
  Rack travel in m: 12.30...12.50**

```

## Aneroid/Altitude Compensator Test

1st version

```
Setting
Speed      rpm      : 1000
Pressure   hPa      : 950
Rack travel mm : 0.00...0.20
```

## Measurement

Speed 1/min : 1000  
1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

## FUEL DELIVERY CHARACTERISTICS

1st version

```

Aneroid pressure h: 1100
Speed rpm : 1400
Del.quantity cm3/ : 38.0...39.5
1000 s: (37.0...40.5)
Spread cm3 : 2.50
1000 s: (3.0)
Aneroid pressure h: 1100

```

```

Speed          rpm      : 1900
Del.quantity   cm3/     : 39.5...41.5
                1000 s: (38.5...42.5)
Spread         cm3      : 2.50
                1000 s: (3.00)
Aneroid pressure h: 1100
Speed          rpm      : 500 *
Del.quantity   cm3/     : 34.5...36.0 *
                1000 s: (33.5...37.0) *
Spread         cm3      : 2.50
                1000 s: (3.00)
Aneroid pressure h: 1100
Speed          rpm      : 800**
Del.quantity   cm3/     : 36.5...38.0 **
                1000 s: (35.5...39.0)**
Spread         cm3      : 2.50
                1000 s: (3.00)

```

STARTING FUEL DELIVERY

```
Speed      rpm      : 100
Del.quantity cm3/    : 52.0...0.0
              1000 s: (52.0...0.0)
Rack travel in mm   : 20.10...0.00
```

HIGH IDLE

```

1st version
Aneroid pressure h: 1100
Speed          rpm : 2100
Rack travel in mm : 7.00...7.50
Del.quantity cm3/ : 22.0...26.0
                1000 s: (21.0...27.0)
Spread         cm3 : 2.50
                1000 s: (3.00)

```

LOW IDLE

```
Speed      rpm      : 315
Rack travel in mm : 5.30...5.50
Del.quantity cm3/   : 5.0...6.0
            1000 s : (4.5...9.0)
Spread     cm3      : 1.00
            1000 s : (1.50)
```

## SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

```
Control lever at idle stop
Speed          rpm      : 340
Rack travel in mm : (11,6...13,0)
Del.quantity cm3/  : -
                1000 s : (29,0...37,0)
Current A       : 1,8
Control lever at full-load stop
Speed          rpm      : 2500
Rack travel in mm : 0,0...1,0
```

Current

short-duration A : 3,0

Starting test

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : -

min. 1000 s: 52,0 / 1,8 A

Remarks:

Pin projection =  $\dot{16.60 \dots 16.70}$  mm

Sliding sleeve pre-travel = 6.25 mm

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:

adjustment and blocking with device

KDEP 1077 =  $15.3^\circ \dots 15.7^\circ$

( $15.2 \dots 15.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

\* Setting point for negative torque  
control - negative retainer behind  
sliding sleeve

\*\* Reference measurement:

Control-rod travel and delivery too

large - position spiral spring

downwards

Control-rod travel and delivery too

small - position spiral spring upwards